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FOREWORD

The QUARTERLY REVIEW OF UROLOGY is designed to present in a concise and authoritative manner not only all progress in the field of Urology alone, but also important developments in other branches of Medicine which are or may become of urologic significance. For a single individual to keep abreast of this mass of material, in which Urology is often inextricably intertwined with other clinical and preclinical sciences, heretofore has been impossible.

The members of the Editorial Board are charged with the responsibility of selecting from every dependable source all contributions which in their judgment are of fundamental importance and unusual merit, to which they may add their own comments. This material is classified under the following headings:

1. Nutrition and Metabolism
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Each anatomic division includes Embryology, Pathology, Diagnosis, and Treatment, and some also embrace Biochemistry, Physiology, and Pharmacology.

At the end of each division there will be references to current articles not abstracted that may be useful to authors in the compilation of their bibliographies.

The Editorial Board will welcome suggestions and criticisms.

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Only information which reaches Unesco before October 1st, 1949 can be used in the Manual and it is therefore in the interests of all institutions concerned to communicate immediately with the above address.

QUARTERLY REVIEW
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1. Nutrition and Metabolism

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2. Preoperative and Postoperative Therapy

THE EFFECTIVENESS OF DRUGS IN PREVENTING POSTOPERATIVE PENILE ERECTIONS.

Robert A. Price, Phoenix, Ariz. and Otto J. Penna, Spokane, Wash. Surgery, 24:980-82, December 1948.

The effectiveness of sodium bromide, oral diethylstilbestrol and hypodermic estrone in preventing postoperative penile erections was studied on 125 young male patients who were to be circumcised. All patients were admitted to the hospital the day before operation and kept there until five days afterwards for strict control of medication, observation and daily recording. A standard operation was used for all. Anesthesia was obtained by dorsal nerve block with 1% procaine and local infiltration if necessary except in a few cases that received caudal block anesthesia of 30 cc. of 2% procaine. The wounds were sponged with tepid boric acid every thirty to sixty minutes the day of operation and no dressings used. This usually produced a dry, painless wound after a few hours.

The patients were divided at random into 5 study groups, the first being a control group who received no medication except aspirin 5 gr. occasionally. The second group received 5 mg. of oral diethylstilbestrol the afternoon before operation and twice daily through the fifth or sixth postoperative day. The third group received sodium bromide 2 Gm. the afternoon before operation and 1 Gm. 3 times daily afterwards. The fourth group were given hypodermic injections of estrone 1 mg. of 10,000 units once daily beginning the day before operation. The fifth group received stilbestrol 5 mg. twice daily from three to seven days preoperatively until the fifth postoperative day.

Results showed the average number of erections per man per day for the control group was 1.43; for the sodium bromide group 1.02; for the estrone group 1.21; for the group receiving diethylstilbestrol commencing the afternoon before operation 1.08; and for the group receiving diethylstilbestrol at least three days preoperatively 0.44. Postoperative complications were minimal. Only 1 of 58 patients given diethylstilbestrol had nausea. These findings indicate that prophylactic stilbestrol therapy to minimize postoperative erections would be especially valuable in plastic operations or amputations of the penis. 6 references. 2 tables.

3. Anesthesia

THE EFFECT OF VASOCONSTRICTORS UPON THE DURATION OF SPINAL ANESTHESIA: A CONTROLLED STUDY IN MAN.

Kenneth E. Bray, Sidney Katz and John Adriani, School of Medicine, Louisiana State University, New Orleans, La. Anesthesiology. 10:40-53. January 1949.

Studies of the effect of vasoconstrictors upon the duration of spinal anesthesia were made on 139 patients who required anesthesia at weekly or ten day intervals. The saddle block technic of low spinal anesthesia was employed, using nupercaine and pontocaine as anesthetics, and epinephrine, neosynephrin, ephedrine and oenethyl as vasoconstrictors. Premedication was used in the earlier cases, all patients given nupercaine and half those given pontocaine receiving morphine, gr. 1/8 to 1/6, and atropine, gr. 1/150 to 1/100, one hour before induction of anesthesia. Premedication was later omitted because this did not unduly upset patients, and sensory examinations and determination of duration of anesthesia could be better made. The anesthetic was mixed with 10% dextrose in physiologic saline solution and combined the vasoconstrictor drug, 1.2 cc. of the solution being given each case. Spinal punctures were made at the fourth or third lumbar interspace, using a 20 or 22 gauge needle. Nupercaine 2.5 mg. or pontocaine 5 mg. was used. Doses of the vasopressor drugs were epinephrine 1 mg., ephedrine 50 mg., neosynephrin 5 mg., and oenethyl 100 mg. The final concentrations were epinephrine 1:1,200, ephedrine 1:24, neosynephrin 1:240, and oenethyl 1:12. A total of 341 saddle blocks were performed.

Results obtained showed that the addition of epinephrine to local anesthetic drugs delayed their absorption and prolonged their action, but no clinically significant changes occurred with the use of ephedrine, neosynephrin or oenethyl. The duration of anesthesia with nupercaine and epinephrine averaged 220.4 minutes compared with 161.8 minutes in controls. Anesthesia with pontocaine and epinephrine averaged 160.6 minutes compared to 99.4 minutes in controls. Nupercaine and neosynephrin averaged 201.6 minutes and controls 186.6 minutes. Nupercaine and ephedrine averaged 179.7 minutes and controls 189 minutes. Combinations of pontocaine with neosynephrin and ephedrine showed similar results, the average increases with vasoconstrictors being only 8.1 and 7% respectively.

The average duration of anesthesia with pontocaine and oenethyl was 90 minutes, and controls 88.7 minutes. The average time before onset of anesthesia was five minutes with and without vasoconstrictors. None of the vasoconstrictors produced any significant systemic or pressor effects or neurologic changes. 14 references. 11 tables.

4. General Surgical Technic

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5. Infections, Parasites, Toxins and Drugs

THE INCREASED PATHOGENICITY OF BACILLUS LACTIS AEROGENES IN URINARY TRACT INFECTIONS.

Seymour F. Wilhelm and Lazarus A. Orkin, Beth Israel Hospital, New York, N. Y. J. Urol. 61:131-39, January 1949.

The authors report a remarkable increase in the frequency of Bacillus lactis aerogenes (Aerobacter aerogenes) urinary tract infection. An analysis of two series of consecutive cases reveals that the incidence has risen from 7.3% in 1940-41 to 49.2% in 1945-48.

Clinical observations indicate that B. lactis aerogenes is now usually pathogenic, often giving rise to serious and sometimes fatal infection. Four cases of bacteremia, each with repeated positive blood cultures showing a pure growth of B. lactis aerogenes, are reported.

Streptomycin sensitivity of B. lactis aerogenes was determined on initial culture in 104 cases. Eighty-eight per cent were found resistant to more than 16 units. Streptomycin sensitivity tests on 44 subsequent cultures showed a remarkable constancy of this characteristic of B. lactis aerogenes.

Of 32 patients treated with streptomycin, only 7 cleared up, and the authors conclude that the usefulness of this drug alone is sharply limited in the treatment of B. lactis aerogenes urinary infection.

Ninety-three cases were followed with repeated cultures, and in 73% the infection persisted. Persistent infections were treated with a variety of drugs, such as penicillin, sulfadiazine, NU 445, mandelamine, singly and in combination. Observations indicate that B. lactis aerogenes urinary infection is in large measure not susceptible to the therapeutic agents in common use up to the time of publication. Antibiotics, as well as sulfa drugs, should, therefore, be selectively administered only to patients whose urine cultures reveal susceptible organisms. 11 references. 4 tables. 2 figures.—*Author's abstract.*

EVALUATION OF TWELVE MEDIA FOR THE ISOLATION OF THE GONOCOCCUS.

Charles M. Carpenter, Matthew A. Bucca, T. C. Buck, E. P. Casman, C. W. Christensen, Ed. Crowe, Ruth Drew, Justina Hill, Charles E. Lankford, Harry E. Morton, Lenore R. Peizer, Carolyn I. Shaw, and J. D. Thayer, U. S. Public Health Service, Staten Island, N. Y. Am. J. Syph., Gonor. & Ven. Dis. 33:164-176, March 1949.

Twelve media recommended for the routine isolation of the gonococcus were compared. A total of 70 strains of the gonococcus was recovered from 209 specimens cultured on all these media. The number of strains recovered by a single medium ranged from 28 to 65.

There were three media which detected the most strains: (1) a modified McLeod's agar with Nile Blue A and enriched with horse plasma and hemoglobin; (2) GC agar base, experimental, with Bacto-Hemoglobin and Supplement B; and (3) Proteose No. 3 agar with Nile Blue A and enriched with horse plasma and hemoglobin. Each recovered 65, 63, and 63 strains, respectively.

The specimens were collected from males and females and were representative of those submitted to a public health laboratory. With the exception of Medium No. II, either Nile Blue A or crystal violet was incorporated in all of the media which yielded the greatest number of strains of gonococci. This emphasizes the value of Medium No. II (GC agar base, experimental, with Bacto-Hemoglobin and Supplement B).

The advantages of Medium No. II over Media Nos. I and III, modified McLeod's agar with Nile Blue A and enriched with horse plasma and hemoglobin, and Proteose No. 3 agar with Nile Blue A and enriched with horse plasma and hemoglobin, respectively, are as follows: (1) simplicity of preparation because it is a dehydrated medium; and (2) the cultures may be examined after incubation for one day. A uniformly prepared dehydrated medium is economical and dependable.

The formula and detailed method of preparation of each medium are described. 7 references. 1 table.

SOME ANTIBACTERIAL PROPERTIES OF MANDELAMINE (METHENAMINE MANDELATE).

John V. Scudi and Charles J. Duca, Yonkers, N. Y. J. Urol. 61:459-67, February 1949.

Mandelamine (methenamine mandelate) was compared in vitro with streptomycin and with sulfathiazole. Each drug was dissolved in sterile buffered urine, using a serial two-fold dilution technique, and 17 strains of bacteria commonly associated with urinary tract infections were then challenged with each of the three drugs. Bacteriostatic and bactericidal studies showed that mandelamine compares favorably with streptomycin and with sulfathiazole in activity. Bactericidal concentrations of mandelamine were no higher than those necessary for grossly observable bacteriostasis, and

are easily obtained in the urine. Lowering the urinary pH from 6.5 to 5.5 increased the activity of mandelamine. Resistance to streptomycin and sulfathiazole appeared rapidly and to a marked degree, and was retained at higher pH levels. In sharp contrast, it was impossible, even after repeated attempts, to elicit any evidence of resistance to mandelamine, and further, organisms resistant to streptomycin and to sulfathiazole retained their original sensitivity to mandelamine. The clinical implications of these findings are discussed. 10 references. 6 tables. 3 figures.—*Author's abstract.*

LOWERED INCIDENCE OF SENSITIZATION THROUGH USE OF SULPHONAMIDE COMBINATIONS. A NEW CONCEPT.

David Lehr, New York Medical College, New York, N. Y. Brit. M. J. 4576:543-48, Sept. 18, 1948.

Critical evaluation of the vast literature on sulfonamide therapy, including the exacting large-scale studies of the armed forces during World War II, gives no support to the widely accepted contention that the incidence of allergic reactions from the sulfonamides is independent of the dosage used. On the contrary, it was found that in the dosage range employed in human prophylaxis and therapy, the incidence of sensitization increases in direct proportion with the dosage of sulfanilamide, sulfathiazole or sulfadiazine. In oral dosage of not more than 2 Gm. in twenty-four hours, none of these sulfonamides appeared to produce rash or fever in any significant percentage of cases, even if used for prolonged periods and repeatedly in the same individuals. The incidence of allergic reactions assumed significant proportions when the dosage was increased to more than 4 Gm. in twenty-four hours, and reached even higher percentages with full therapeutic amounts of 6 Gm. or more in twenty-four hours, provided medication was maintained for a minimum of three to five days. These observations indicate that the production of so-called sensitization reactions is dependent upon the repeated presence in the tissues of certain critical concentration of a sulfonamide for a minimum period of several days. The notorious frequency of sensitization following local application is explicable on the same lines: if a sulfonamide is applied to eczematous skin or to any wound, absorption will lead to high concentrations in the underlying tissues. It is generally believed that sulfonamides can function only as haptens, the actual sensitizing agent being a compound of the drug and a body protein. This view is supported by the behavior of sulfathiazole, which has both a high protein binding power and a marked tendency to cause sensitization. In the majority of patients, sensitization is limited specifically to the sulfonamide used. The simultaneous administration of several sulfonamides in partial dosage should result in reduced incidence of sensitization because it permits dilution of individual drug concentrations below the level necessary for the production of allergy. Proof of this concept was derived from practical experience in 610 patients treated with combinations of two or three sulfonamides, including sulfadiazine, sulfamerazine and sulfathiazole. The incidence of drug rash and fever at the full therapeutic dosage of 6 Gm. in twenty-four hours was con-

spicuously low and nowhere exceeded 2%. It has yet to be established whether compounds closely related structurally, such as homologues and isomers (sulfadiazine, sulfamerazine, sulfapyrazine), can be distinguished by the cells of the body as specific haptens. Should they prove indistinguishable, the danger of sensitization from their combined partial dosages could still not be greater than if the equal amount of any one of these drugs had been employed. Hence no increased or additive incidence of allergic reactions should be expected from any mixture of sulfonamides as long as concentrations of individual drugs in the tissues are kept well below the level necessary for the production of sensitization. The significance of this new concept and its possible bearing upon toxic reactions from compounds of the thiouracil series and drug allergy in general are discussed. 106 references.—*Author's abstract.*

PROCAINE PENICILLIN G IN SESAME OIL. A STUDY OF REACTIONS AND RESULTS IN 400 CASES.

William E. Wellman, Mayo Foundation, and Wallace E. Herrell, Mayo Clinic, Rochester, Minn. Proc. Staff Meet., Mayo Clin. 23:595-600, Dec. 8, 1948.

The success of the administration of the material depends upon a number of factors. The 10 cc. ampule is superior to the 1 cc. container for routine administration. The vial should be shaken vigorously in order to prepare an evenly divided suspension. The material should be withdrawn from the container by use of a 19 or 20 gage intramuscular needle. The needle should be 2 to 2½ inches in length. Injections should be made by the quick stab method deep into the muscles in the region of the upper outer quadrant of the buttocks. The material must not be given subcutaneously. The needle should enter the tissue at a right angle to the surface of the skin, and should be quickly withdrawn after the injection is made. The area should not be massaged. Procaine penicillin is effective for prolongation of action of penicillin. It has an anesthetic effect and it appears to have some slight antihistaminic activity. On occasion, patients who have developed urticaria following the administration of regular penicillin have been able to take procaine penicillin without exhibiting this phenomenon. Excellent therapeutic results have been obtained by using procaine penicillin in sesame oil. At the same time, the incidence of reaction is considerably lower than that experienced following the use of previously available regular and depot penicillins. Four hundred patients received a total of 1,718 injections with a median of three injections. The total number of reactions encountered in 400 patients was three (0.75%). Two of the reactions manifested themselves as an area of local redness and edema at the site of injection. Only one was an example of generalized urticaria. For prolongation of action and good therapeutic effect in the treatment of moderately severe infections, this preparation is to date the one of choice. 3 references. 2 tables.—*Author's abstract.*

THE STREPTOMYCIN TREATMENT OF GENITO-URINARY TUBERCULOSIS.

John K. Lattimer, J. Burne Amberson, et al. J. Urol. 60:974-85, December 1948.

The Veterans Administration Research Group has conducted an exhaustive study of the effects of streptomycin on genitourinary tuberculosis. The full therapeutic dosage was 1.8 Gm. daily (0.3 Gm. every 4 hours) intramuscularly for 120 days. A prophylactic dosage of 0.5 Gm. twice daily for 21 days was given at the time of any operation upon a tuberculous organ to prevent dissemination of the disease.

All tuberculous renal lesions, which had not caused sufficient excavation of the kidney parenchyma to be detectable in the pyelogram, responded well. Eighty to 100% of such cases became negative for tubercle bacilli in the urine and have remained negative for up to two years. Larger renal lesions which were extensive enough to be obvious in the pyelogram were usually accompanied by so much thick fibrocaseous and necrotic tissue that they responded poorly. Thirty-five to 40% of such cases became negative for tubercle bacilli in the urine, however, and have remained negative up to two years.

Symptoms improved within a few weeks, sometimes even before the urine became negative. Superficial cystitis improved markedly on this regimen, but deep-seated bladder contractures did not improve. Prostatic and epididymal lesions improved so little that the full course of streptomycin was not advised, since its use might cause the tubercle bacilli to become resistant, thus depriving the patient of his only therapeutic weapon in case of later miliary, meningeal, or renal spread of the tuberculosis.

One hundred and twenty days of treatment with streptomycin was advised in bilateral renal tuberculosis, tuberculosis in a solitary kidney, or in proven early renal tuberculosis before the pyelogram showed excavation. The 120 day course was also advised in severe superficial tuberculous cystitis. The full course of treatment was not advised where one kidney was found to have a unilateral, advanced tuberculous lesion. Nephrectomy was recommended in these cases, with careful handling of the ureter and the administration of a prophylactic course of only three weeks of streptomycin at the time of nephrectomy (or epididymectomy) as a precaution against dissemination of the tubercle bacilli at the time of operation. Three weeks of streptomycin will not cause resistance to develop. The results of this study have been encouraging, especially with early tuberculous lesion. 7 figures.—*Author's abstract.*

STREPTOMYCIN THERAPY IN UROGENITAL TUBERCULOSIS.

Leon Herman, Philadelphia, Pa. J. Urol. 61:122-30, January 1949.

Urogenital tuberculosis has become a rather rare disease in the continental United States. Comparatively few individuals with these lesions have been subjected to streptomycin therapy, largely because of paucity of

cases. Laboratory evaluation of the activity of streptomycin against the tubercle bacillus is fully discussed, and the opinion expressed that results obtainable in recently inoculated animals necessarily differ from those noted in the treatment of human infections. The latter produce chronic necrotizing and sclerosing lesions from which blood-borne agents are largely excluded. Accumulated clinical and pathological data confirm these early observations. The varying degrees of sensitivity of the many bacterial strains, and the development of acquired resistance to streptomycin, are mentioned.

The literature on the use of streptomycin up to 1948 is reviewed. No attempt is made to evaluate the supposed synergistic action of various other agents when used in conjunction with streptomycin, the opinion of the author being that this is impossible. The biochemistry of streptomycin, its dosage and toxicity, are discussed, together with the tendency to employ smaller doses without apparent loss of therapeutic effect.

The personal experience of the author includes the apparent cure of a case of early unilateral renal tuberculosis with parenchymal cavitation in which the infection was eradicated with complete healing of the renal lesions. This patient remains well (4-23-49).

On the basis of personal experience, reported data, and those collected by questionnaire, the following conclusions are made:

(1) There is yet no justification for attempting final evaluation of streptomycin therapy on the basis of clinical experience; (2) streptomycin exerts considerable bacteriostatic effect on tubercle bacilli resident in the human urogenital tract: (3) total arrest of bacterial activity seems to occur in some cases of urogenital tuberculosis but this often proves to be temporary; (4) streptomycin promotes the healing of tuberculous operative wounds and may prevent their occurrence: (5) streptomycin is most effective in the treatment of early tuberculous lesions.

Tubercle bacilli embedded in chronic sclerosing and necrotizing lesions are probably not affected by blood-borne agents, such as streptomycin, for mechanical reasons. The probabilities are that the unilateral surgical tuberculous kidney should be removed in the absence of active pulmonary tuberculosis or other extrarenal complications. There is, however, neither clinical nor pathological evidence to deny the possibility of cure by streptomycin in very early cases. There is the possibility that the preoperative use of streptomycin in apparently unilateral renal infections may decrease the incidence of active tuberculosis in the supposedly healthy kidney after operation. If streptomycin is used preoperatively the possibility of injury to the apparently healthy kidney must be kept in mind. 18 references.—*Author's abstract.*

STREPTOMYCIN IN GENITO-URINARY TUBERCULOSIS. A PRELIMINARY REPORT OF 10 CASES.

A. C. Abernethy (Capt., M.C., U.S.N.), and H. H. Edelbrock (Lt., M.C., U.S.N.), U. S. Naval Hospital, Oakland, Calif. J. Urol. 61:410-17, February 1949.

Ten cases of genitourinary tuberculosis have been treated with larger doses of streptomycin than previously reported. The progress of these cases

has been followed for periods of twelve to twenty-four months.

The methods used were based on the reports of other investigators that streptomycin would protect experimental animals from tubercule bacilli; would inhibit tubercule bacillus growth in vitro; would be excreted by the kidneys in high concentration; would be established in the tissue parenchyma in good concentration; would produce evidence of healing in genitourinary lesions of human miliary tuberculosis; and that streptomycin had reportedly not been given in adequate amounts for satisfactory evaluation.

In all of the cases under study, the previously acceptable therapeutic measures were used, and streptomycin therapy was instituted when these proved inadequate. This group of cases presented a variety of tuberculous lesions involving epididymis, testicle, prostate, seminal vesicles, bladder, ureter and persistent postoperative tuberculous sinuses.

The dosage of streptomycin was in all cases started at 3.2 Gm. per day (.4 Gm. every three hours) and was reduced to 1.6 Gm. per day (.2 Gm. every 3 hours) when evidence of toxicity seemed great. The total dosage was 400 Gm. in 6 cases, 300 Gm. in 2 cases and 250 Gm. and 170 Gm. respectively in 2 other cases.

Nine of the ten patients now have no demonstrable genitourinary tuberculosis. One patient died of uremia with generalized tuberculosis and 75% tuberculous destruction of his remaining renal parenchyma. The toxic reactions observed were essentially the same as those reported elsewhere. None of the nine recovered patients has sufficient permanent vestibular damage to prevent his returning to his usual occupation. 12 references.—*H. H. Edelbrock.*

STREPTOMYCIN THERAPY IN A CASE OF SULFONAMIDE-RESISTANT HEMOPHILUS DUCREYI (CHANCROID) INFECTION.

W. D. Weber (Capt., M.C., A.U.S.), J. H. Williams, and T. R. Huffines, Veterans Administration, Oteen, N. C. Am. J. Syph., Gonor. & Ven. Dis. 33:58-59, January 1949.

A twenty-five year old Negro was admitted for treatment of pulmonary tuberculosis. Two months previously he had been treated for secondary syphilis and acute gonorrhea. One month after admission he developed a small papule at the mucocutaneous junction behind the glans penis. The lesion progressed to a pustule which erupted, forming an ulcer with undermined edges. The blood serologic test was positive. Dark field examination of the lesion was negative.

The patient was treated with green soap and sulfathiazole four times daily. The initial dose of sulfathiazole was 3.0 Gm. followed by 1.0 Gm. every four hours. The H. ducreyi intradermal test was strongly positive one week after therapy. Dark field examinations twenty-four days after treatment were negative for Treponema pallidum. Smears for Ducrey's bacillus were positive. Throughout therapy the lesion increased in size and drained profusely. Sulfathiazole was discontinued. Streptomycin, 0.5 Gm., every twelve hours, was started and continued for two weeks. On the third day of strepto-

mycin therapy, smears and cultures were negative for Ducrey's bacillus. On the seventh day the lesion had decreased about two thirds and by the twelfth day the lesion had completely healed and streptomycin was discontinued after-fourteen days. 2 references.

THE TREATMENT OF CHANCROID WITH STREPTOMYCIN.

S. Ross Taggart, Harold L. Hirsh, Franklin D. Hendricks, G. Roland Gable, Michael A. Puzak, and Aston B. Greaves, Bureau of Venereal Diseases, District of Columbia Health Department, Washington, D. C. Am. J. Syph., Gonor. & Ven. Dis. 33: 180-81. March 1949.

Treatment with streptomycin was carried out in 61 patients. Therapy was begun as soon as diagnosis was made. All patients had typical soft, necrotic, genital ulcers, usually multiple, and the lesions were present from seven days to three months before admission. Buboes were present in nineteen patients. All but 2 patients were Negroes. There were 45 males and 16 females ranging in age from 17 to 51 years. Six patients were previously treated unsuccessfully with sulfonamides.

Forty-two of the 61 patients were hospitalized. Twenty-five of the hospitalized patients were given streptomycin, 1 Gm., every four hours, and therapy was continued daily until the lesions had completely healed. This required five to nineteen days. Seventeen hospitalized patients were given 1 Gm. streptomycin daily, as one dose, for five days.

With large or multiple lesions, or lesions apposed or covered by skin, healing was slow. Recovery was facilitated if buboes were aspirated as they became distended. There were no apparent differences in the rate of healing from the two schedules of treatment. All patients were cured.

Nineteen out-patients were given 2 Gm. streptomycin daily, as one dose, for five days. The lesions completely healed in five patients and 6 patients showed improvement; 2 improved but have not been followed up. Two males and 4 females failed to obtain healing on this treatment.

Healing was more rapid and progressed more favorably in the patients who were hospitalized. The factor of bed rest was probably more important in inducing healing, although some of the larger necrotizing ulcers in the hospitalized patients received saline soaps for a short period. 3 references.

STREPTOMYCIN THERAPY OF GRANULOMA INGUINALE.

John J. Stewart, (U.S.P.H.S.), and William E. Laub, Wayne University Medical School. Am. J. Syph. Gonor. & Ven. Dis. 33:65-67. January 1949.

A series of 15 patients with granuloma inguinale were treated with streptomycin. The drug was administered in divided doses every four hours, 13 cases receiving 3 Gm. daily for three days, 2 Gm. daily for three days, and 1 Gm. daily for five days. This schedule was used because it has been proved that a total dose of 20 Gm. is sufficient. Of the other 2 patients, 1 received 1 Gm. daily for fifteen days and 1 received 4 Gm. daily for five days. Subjective improvement occurred in twenty-four to forty-eight hours in all cases, and was followed by complete or nearly complete healing in ten

days to three weeks. The smaller lesions healed more rapidly. Half the patients complained of pain at the site of injection, but sensitivity reactions, renal irritation, and vestibular dysfunction did not occur. A group of 5 patients were followed four months or more without any relapse being observed.

Greenblatt and associates showed that streptomycin is effective in healing granuloma inguinale, with rapid involution of lesions and complete healing occurring in one to three weeks in 91 patients. Donovan bodies disappeared in two to eleven days. Eight relapses occurred in 32 patients treated with 2 Gm. streptomycin daily for varying periods up to sixty-two days, but only 1 relapse occurred in 52 patients given 4 Gm. daily for five days. A treatment schedule is therefore recommended of 4 Gm. of streptomycin in divided doses every four hours for five days. Febrile reactions occurred in half the patients receiving the rapid treatment but these subsided in three to five days. A few patients had minor sensitivity reactions such as pruritis and urticaria but there was no eighth nerve involvement. 7 references. 1 table.

TOXIC REACTIONS DURING STREPTOMYCIN-SULFADIAZINE THERAPY OF BRUCELLOSIS.

Norman B. McCullough and C. Wesley Eisele, School of Medicine, University of Chicago, Chicago, Ill., J.A.M.A. 139:80-82, Jan. 8, 1949.

In treating brucellosis with streptomycin and sulfadiazine, toxic reactions of the nervous system occurred which were out of proportion to the small dosage, and which involved more widespread areas of the brain than has generally been recognized. In 2 cases severe encephalopathies occurred within a few hours after the initial dose of streptomycin.

In Case 1, a 24 year old woman was given sulfadiazine, 6 Gm. per day; twenty-four hours later 3 Gm. of streptomycin were given in divided doses, and then 4 Gm. on the next day. Following this, the dose was reduced to 2 Gm. daily for the next eight days. Sulfadiazine was continued for an additional eleven days. One week after stopping streptomycin therapy, an additional 4 Gm. were given for twenty-four hours. During the second day of streptomycin therapy, the patient showed alarming symptoms of central nervous system disturbance. On reducing the dose of streptomycin to 2 Gm. daily, the symptoms decreased but did not disappear. When streptomycin was given again one week after being stopped, all symptoms and signs reappeared, but eventually disappeared.

A fifty-year old female (Case 2) with brucellosis was started with a daily dose of sulfadiazine, 6 Gm.. The next day, streptomycin therapy was started, 2 Gm. daily, and continued for fourteen days. Sulfadiazine therapy was continued for an additional four weeks. On the second day of streptomycin treatment, marked central nervous system disturbances arose. All symptoms appeared after 2 Gm. of streptomycin were administered, and became maximal after 4 Gm. They persisted but did not progress during the remainder of the course of streptomycin, and later disappeared. Labyrinthine function, which was originally disturbed, has not returned to normal after five months. 12 references.

THE TREATMENT OF GONORRHEA WITH STREPTOMYCIN

S. Ross Taggart, Harold L. Hirsh, Franklin D. Hendricks, G. Roland Gable, Michael A. Puzak and Aston B. Greaves, Washington, D. C. Am. J. Syph., Gonor. & Ven. Dis. 33:177-79, March 1949.

Dr. Taggart and his co-workers report results, in the treatment of 229 patients with gonorrhea, with a single intramuscular injection of streptomycin. Treatment with 0.2 Gm. or more produced cure rates of over 90%. With a dosage of 0.1 Gm. the cure rate was only 40%.

Attention is called to the low spirocheticidal action of streptomycin; a single injection of 0.5 Gm. failed to produce any demonstrable effect on activity of spirochetes at six, twelve and twenty-four hours, to its mild toxic reactions and to the ease of administration. They found that patients failing from initial treatment could be cured by an increased dose of the antibiotic. 6 references.—*Author's abstract.*

STREPTOMYCIN IN SURGICAL INFECTIONS. VII. NON-PULMONARY TUBERCULOSIS (LYMPH NODES, URINARY TRACT, BONE AND PERITONEUM).

Edwin J. Pulaski (Major, M.C., A.U.S.), James F. Connell (1st Lt., M.C., A.U.S.), Adam Kowalczyk (1st Lt., M.C., A.U.S.) and Sam F. Seeley (Col., M.C., A.U.S.) Brooke General Hospital, Fort Sam Houston, Tex. Ann. Surg. 129:90-102, January 1949.

Of 35 patients with tuberculous lymphadenitis given 1.5 to 2.0 Gm. of streptomycin intramuscularly in three to five injections daily for 10 to 120 days, good results were obtained in 9 of 13 uncomplicated cases treated only with streptomycin, and in 5 of 6 uncomplicated cases in which combined streptomycin and surgery were used. Of 16 cases complicated by sinus formation, good results were obtained in all of 3 given streptomycin and surgery, and in 11 of 13 treated only with intramuscular streptomycin. Follow-up examinations revealed two relapses. Results of streptomycin therapy were generally better and prompter when surgical measures were combined with it.

Of 46 patients with tuberculosis of the genitourinary tract, 11 who received 2 Gm. of streptomycin intramuscularly daily for 60 to 80 days, and in whom the infection was confined to this system, improved. Twenty-four doubtfully improved and the remaining 11 unimproved patients had complications or had received one Gm. or less of streptomycin daily.

The following are considerations for the use of streptomycin in tuberculosis of the genitourinary system:

1. To be given prophylactically before, during, and after operations on infected organs to prevent wound infection;

2. To be given for a draining tuberculous sinus, assuming that the main focus of infection has been resected;

3. To be given for tuberculous cystitis;

4. When the renal infection is accompanied by moderate pulmonary tuberculosis the genitourinary infection is especially resistant to streptomycin;

5. The dosage of streptomycin should not be less than 2 Gm. daily (as 0.5 Gm. every six hours).

Of 24 patients with osteal tuberculosis, 17 out of 18 with Potts' disease improved after receiving 1-3 Gm. of streptomycin daily for 38 to 140 days: and 3 out of 6 with lesions of the bones of the extremities showed good results, while 3 showed fair results after receiving 1 to 2 Gm. daily for an average of 90 days, which in 1 patient was augmented by irrigation with 1 Gm. for 205 days.

Of 16 patients with ulcerative tuberculous enteritis treated with 1.5 to 4.7 Gm. intramuscularly in divided doses daily for 28 to 120 days, 11 were markedly improved. 2 references.—*Author's abstract.*

APPRAISAL OF ORAL STREPTOMYCIN AS AN INTESTINAL ANTISEPTIC, WITH OBSERVATIONS ON RAPID DEVELOPMENT OF RESISTANCE OF E. COLI TO STREPTOMYCIN.

John S. Lockwood, Alfred D. Young, McLemore Bouchelle, Thomson R. Bryant, Jr., and Alfred J. Stojowski, Presbyterian Hospital, New York, N. Y. Ann. Surg. 129:14-21, January 1949.

A series of 24 cases treated with oral streptomycin is presented, together with the methods used to obtain serial quantitation colony counts on 3 groups of organisms studied, the coliform group, the streptococcus, and the clostridia. Nineteen patients received 0.25 Gm. of streptomycin every six hours, and the other 5 received 1.0 Gm. every six hours; there was no essential difference in results between the two groups.

Inconsistent results were obtained. About half the cases treated in the coliform group showed no response to streptomycin. In the cases showing a response, half of these displayed a prolonged significant response. There was no significant reduction in the number of streptococci in the stool in 87.7% of the cases. There was no significant reduction in the number of clostridia in the stool in 38.9% of the cases. Sensitivity titrations on the E. coli showed rapid development of resistance to streptomycin; the results showed that many of the strains become able to proliferate in the concentrations of streptomycin which are found in feces.

Nine cases were treated with combined streptomycin and sulfathaladine. Dosages were 0.25 Gm. streptomycin and 1 Gm. sulfathaladine every six hours by mouth. The results were also inconsistent.

It appears that oral streptomycin is unpredictable and unreliable. Its use for preoperative preparation of patients requiring large bowel surgery cannot be recommended. The series of cases is too small to permit final conclusions to be drawn. 11 references. 3 tables.

PAPAVERINE. ITS VALUE AS AN ANTISPASMODIC IN UROLOGY.

Joseph Fischmann, Tufts College Medical School, Boston, Mass. J. Urol. 60:534-36, September 1948.

The author calls attention to an antispasmodic which he has been using

for the past seventeen years, and with which he has obtained remarkably good results. It is papaverine.

The reason why papaverine has not become a more widely used antispasmodic in urology is that a single dose is readily destroyed once it enters the system. This is especially true when administered by mouth. There is no objection to its intravenous or hypodermic use, but, when given in this manner, the action is too prompt and of too short duration. Pharmacological studies, however, have shown that papaverine is readily absorbed by the rectal mucosa and at a rate which allows a continuous effect. In a suppository it can be given in fairly large doses without causing any untoward effects. Furthermore, this is an easy means of self administration.

The action of papaverine differs from that of morphine in that papaverine relieves spasm in the urinary tract while morphine increases it. Both will alleviate pain but papaverine is a more effective analgesic because of its antispasmodic action.

The uses of papaverine in urology are many, and it is indicated wherever a spastic condition exists. In acute distress it may be given intramuscularly or intravenously, but after one injection it is best to continue medication with suppositories in order to maintain prolonged action. In the acute colic caused by renal or ureteral calculi, an intramuscular injection of 100 mg. papaverine hydrochloride may be given. If this fails to give relief it may be repeated in half an hour. In order to keep the hollow system relaxed, suppositories containing 125 mg. for the patient of average weight should be used at 2 hour intervals until relief is obtained. Not more than 5 suppositories should be given.

In the quiet phase of a ureteral stone of suitable size, satisfactory results have been obtained: i. e. the stone has passed spontaneously with the following regimen: The patient is instructed to insert a 125 mg. papaverine suppository every hour for four hours, a total of 5 suppositories. Fluids should be forced (1 quart every hour for four hours). This plan can be carried out once or twice a week without interfering with the patient's daily duties. It may be repeated at three or four day intervals for a period of three or four weeks, unless the condition of the kidney demands prompt relief of the obstruction.

Painful bladder spasms resulting from the presence of a suprapubic tube, pack or hemostatic bag respond well to 125 mg. papaverine suppositories given every three hours, if necessary, for several days. The same is true of the painful tenesmus due to acute and chronic cystitis, tuberculous cystitis and acute posterior urethritis. Painful spastic reaction after retrograde pyelography or other instrumentation of the ureter, painful priapism, Peyronie's disease, and painful erections following operation on the penis (e. g. urethrotomy, repair of hypo- and epispadias, circumcision, etc.), are further indications for the use of papaverine suppositories. 15 references.—*Author's abstract.*

6. Calculosis

THE LOOPED CATHETER URETERAL STONE EXTRACTOR: PERPLEXITIES IN ITS CONSTRUCTION AND USE.

Milo Ellik, Long Beach, Calif. J. Urol. 61:351-58, February 1949.

A report of thirty-four months' experience with the looped catheter ureteral stone extractor is presented. There have been no deaths or undesirable accidents, and 131 stones have been extracted. Commercial models are not entirely satisfactory and detailed rules for home-made construction are given. The instrument should be stored without bends or kinking. If sterilization is done by boiling, subsequent emersion in a cold solution will insure the return of maximum rigidity.

Each extractor should be carefully scrutinized prior to insertion. The looped part should always be inspected. Insertion should not be preceded by insertion of other ureteral catheters unless the extractor cannot be passed. The extractor should not be twisted at any time during passage. The loop is formed by pulling on the pull filament and pushing on the catheter with the opposite hand. If the instrument tip is in a calyx, resistance is felt and slight withdrawal will allow the loop to close. The loop can be formed within the ureter if the whole length of the looped portion can be insinuated past the stone. Pelvic closure is desirable, if possible.

Withdrawal of the loop toward the stone must be done very slowly and must never be jerky. The quick release of the first hang as the tip of the loop slides by the stone is startling. The operator must watch for this and immediately cease traction, otherwise engagement will be lost or a passable stone may be impacted more firmly. In the absence of stone, the loop simply does not hang until its tip reaches the ureteral orifice. At this point the tip can be seen cystoscopically, and the obstruction obviated by a slight twist with additional traction. When engagement is certain, the cystoscope should be removed prior to traction. If impaction continues after persistent pull, all traction should be stopped and reapplied several hours later, the redundant part of the instrument being taped to the patient's abdomen in the meantime. With manual traction rather than weights and pulleys, most calculi come away within twenty-four hours. Traction should never exceed 4 pounds of sustained pull.

When an engaged stone slips through the ureteral orifice, elimination of hang is sudden and unmistakable. When this happens, the ureteral orifice is within or against the bladder neck. The bladder neck is a convenient brace and the lumens of the ureter and urethra become almost entirely contiguous. This protects against ureter fracture and facilitates stone passage.

In follow-up, there should be early ambulation and forced fluids. Pyelographic studies are done. Ureteral meatotomy is occasionally necessary. With the looped catheter, an office procedure can be considered in a occasional case. There is usually very little pain. 1 reference. 5 figures.

7. Hemorrhage and Shock

See Contents for Related Articles

8. Anomaly

See Contents for Related Articles

9. Kidney and Capsules

MULTINUCLEATED EPITHELIAL CELLS IN THE TUBULES OF THE HUMAN KIDNEY.

John W. Harman and John M. Hogan, Jr., University of Wisconsin Medical School, Madison, Wis. Arch. Path. 47:29-36, January 1949.

Studies of the occurrence of these cells in the renal tubules were made because of the possible influence of diet upon the structure of renal tubules and the fact that renal giant epithelial cells are found in 15.2% of routine autopsies. The multinucleated giant cells found in the proximal convoluted tubules must not be confounded with those in the distal tubules occurring in various forms of lower nephron nephrosis. The former are not usually associated with a visible precipitate or concretion, whereas the latter are a type of reaction to material deposited in the tubules. These giant cells were formerly generally accepted as a form of atypical regeneration but the frequent absence of specific destructive lesions indicated that there was no local stimulus to giant cell formation. Studies also showed that these cells were rarely found in regenerative conditions but frequently in shrunken kidneys and kidneys without other lesion.

Absence of mitoses in human renal giant cells and the fragmentary character of many nuclei suggest that they belong to the degenerative cell type and are not a progressive, atypical form of hyperplasia. Presence of mitotic figures was also demonstrated for some time after death, showing that the cells were of the degenerative rather than progressive types. They have also been found to be definitely connected with the higher age group, increasing progressively after the age of 40, so that age is now regarded as a most significant factor in their pathogenesis. This indicates that occurrence of these cells in shrunken, arteriosclerotic kidneys is probably because such organs usually occur in aged persons. The cells might be expected more frequently in the shrunken form of glomerulonephritis if shrinkage were a stimulus, but such is not the case. The absence of mitoses, the nuclear fragmentations and the age incidence of these cells indicate that they are a result of senile change peculiar to the kidney, and a degenerative rather than an atypical regenerative type. 24 references, 2 tables, 2 figures.

TRUE RIGHT SUPERNUMERARY KIDNEY DIAGNOSED PREOPERATIVELY.

Charles Montgomery Stewart, Moore-White Foundation, Los Angeles, Calif. J. Urol. 61:327-32, February 1949.

A 59 year old man was referred for an examination because of "a possible chronic prostatitis." His chief complaint was recurrent attacks of lower abdominal midline pain, generally following attempts at lifting or straining

during bowel movements. The pain radiated into the pelvis. Distress lasted five to ten minutes. Nausea was not relieved by bowel movements. The pain was relieved by lying down. There were four to six attacks in one year. The physical examination was essentially negative. An intermittent microscopic hematuria was found. The prostate was grade 1 in size, soft and moderately tender. The prostatic fluid had 12 to 15 pus cells per high power field. A plain roentgenogram of the abdomen was negative. Intravenous urograms were taken. The right pyelogram showed a rudimentary type of pelvis and calyces.

Cystoscopy was undertaken. A 5 W. ureteral catheter was passed through the upper right orifice to 25 cm., where obstruction was noted, and 8 cc. of clear urine dripped from the catheter. Retrograde pyelograms were taken. A pyelo-ureterogram taken in the upright position revealed the dilated pelvis and calyces of a third kidney, to the right of the spine. Cystoscopy was again done and catheters were passed into all 3 ureters. Surgical exploration was performed. The extra kidney was readily exposed on the right side and was removed. The pathological diagnosis was hydronephrosis of the supernumerary kidney. The postoperative course was uneventful.

This is the fourth case on record of a true supernumerary kidney diagnosed preoperatively. The operation consists of transperitoneal removal of the anomalous kidney through a transverse abdominal incision. 4 references. 4 figures.

AN UNUSUAL RENAL ANOMALY: COMBINED TANDEM AND HORSESHOE KIDNEY.

Phillip B. Potampa, Milton D. Hyman and Charles E. Catlow, U. S. Veterans' Hospital, Portland, Oregon. J. Urol. 61:340-43, February 1949.

A 55 year old white man complained of pain and swelling in the left flank, "stones in the kidney" and supposed "horseshoe kidney." For almost ten years he had occasional attacks of burning on urination, pain in the right lower quadrant, and "pus in the urine." He was admitted in 1941 with nausea, vomiting, and pain in the right lower quadrant. Following cystoscopy he was said to have a horseshoe kidney, with a calculus in the left pelvis. In 1942 he was readmitted and treated conservatively for pyelonephritis. In 1944 a staghorn calculus was removed in the left superior renal pelvis. The left kidney was divided into two kidneys, connected by a fibrous band. The inferior part of this kidney was continuous across the midline to the right kidney. The vessels lay paradoxically posterior to the pelvis. The pelvis of the superior portion had its own ureter. The inferior part and pelvis from the right kidney were drained by a ureter that swung over from the right side. The patient became asymptomatic until 1945 when he received penicillin therapy which relieved the signs and symptoms of pyelonephritis. Since 1946 there was increasing swelling over the operative area, and mild colicky pain radiating from the left flank to the left groin.

In 1947, retrograde pyelography was done. The catheter in the right ureter was seen to cross the midline, in the plain film, and end in the region

of the left kidney. It passed over to the left, to within a few cm. of the tip of the left catheter. After dye administration there was seen a broad sweeping pelvis which crossed the midline from right to left, ending on each side in discrete pelves with their own calyces; there were actually two pelves joined by a bridge. The fused pelvis was anterior to the vertebral column, typical of horseshoe kidney, whereas the superior component of the left renal mass was deep in the paravertebral space, the normal kidney location. Only one ureter appeared to be connected with these fused pelves and this ureter emerged from the right side of the bladder and entered the pelvis to the left of the midline. There was also a separate pelvis on the left side which was moderately hydronephrotic. The outline of this kidney was faintly seen at its upper pole. The lower pole was superimposed upon the left part of the paired kidneys already described. 6 references. 2 figures.

TRANSTHORACIC NEPHRECTOMY.

Henry Mortensen, St. Vincent's Hospital, Melbourne, Australia. J. Urol. 60:855-58, December 1948.

Three main principles should be followed in the surgical attack on any renal tumor; viz.,

(1) the removal of the kidney with an adequate amount of perirenal fascia and fat; (2) the early ligature of the vessels of the renal pedicle to avoid dangerous haemorrhage from the large vessels which invariably course over the surface of a large tumor; and (3) the avoidance of unnecessary trauma to the renal substance with its attendant risk that portions of tumor growth may be forced into renal veins and vena cava with the certainty of rapid metastatic formation.

The adoption of these principles demands adequate exposure. It is pointed out that, on occasion, such exposure may be best achieved by a transthoracic route. In the case reported, that of a large tumor for which an unsuccessful attempt at removal had been previously made, this route had been followed.

In the lateral position an incision was made along the tenth rib from the vertebral border for its whole length and continued forward to the edge of the left rectus muscle in line with the umbilicus. The tenth rib was then removed subperiosteally, the pleura opened under positive pressure, and the lung packed off. The incision was then extended into the peritoneal cavity and the tumor identified. The suspected adhesions between colon and tumor were adequately confirmed. A hand was passed up to the diaphragm lateral to and above the tumor, and some adhesions separated in the process. With this as a guide, the diaphragm was incised. The patient was then rolled into the supine position and the splenic flexure and descending colon dissected from the tumor. The bowel and the stomach were next reflected medially and the vessels of the pedicle secured. In this maneuver the tail of the pancreas was found adherent to the mass and was removed. This further necessitated removal of the spleen. It was then possible to free the tumor in all planes and to lift it from its bed. The peritoneal cavity was closed

without drainage. Drains were inserted in the renal bed and the diaphragm and pleura closed by accurate suturing. The patient stood the procedure very well and convalescence was uneventful. 4 figures.—*Author's abstract.*

KIDNEY SUSPENSION BY USE OF FASCIA LATA.

J. E. Strode, Clinic, Honolulu, Hawaii. J. Urol. 61:11-19, January 1949.

Experience over a considerable period of time has convinced the author that suspension of the ptotic kidney in properly selected cases by the use of fascia lata gives gratifying results.

While in general, conservative measures to correct this condition have proven ineffective, it is emphasized that the mere fact that the kidney is misplaced is by no means justification for surgical intervention. Recurring attacks of pain and tenderness in the kidney region and along the ureter, usually accompanied by bouts of urinary infection, are the most frequent symptoms. If, in addition, a misplaced kidney is demonstrated by physical examination and excretory urograms which show some degree of hydronephrosis, nephropexy is indicated, in the absence of other findings, to account for the patient's symptoms.

The method of suspension as described is simple of execution and, in the experience of the author, the results have been permanent.

Illustrative case reports and technique of the operation are included. 1 reference. 7 figures.—*Author's abstract.*

RESECTION OF THE TWELFTH RIB IN THE SURGICAL APPROACH TO THE RENAL FOSSA.

Frank A. Hughes, Faculty of Medicine, Montevideo, Uruguay. J. Urol. 61:159-62, February 1949.

The method of exposure of the renal fossa begins with the resection of the end of the twelfth rib with the idea of freeing the muscles that insert in it. After that the external oblique is pushed forward, the internal oblique is pushed forward and downward, leaving the aponeurosis of the transverse muscle exposed, which is sectioned in a line parallel to the twelfth intercostal nerve. In this moment the pararenal space is exposed. To increase the exposure superiorly the fingers are introduced to push the fibers of the diaphragm and the pleura upward. A variation after the resection of the rib is to incise the lumbo-dorsal fascia beneath the anterior part of the costal bed, a point that is away from the pleura when the twelfth rib is long. In this way the transversus is separated from the diaphragm, which carries the pleura upward. The aponeurosis of the transversus is then sectioned as in the first manner.

This method is of value in: (1) exposure of the upper pole of the kidney; (2) plastic operations of the renal pelvis; (3) removal of a large part of the perirenal tissues (tuberculosis); (4) exposure of the renal pedicle with the least manipulation of the kidney (tumors); and (5) exposure of the adrenal glands. 7 references. 2 figures.—*Author's abstract.*

ADDISONIAN CRISIS PRECIPITATED BY NEPHRECTOMY.

Joseph J. Kristan, Veterans Administration Hospital, Coral Gables, Fla. J. Urol. 61:178-83, February 1949.

A case of latent adrenal cortical insufficiency in a 37 year old white man, diagnosed and treated only after nephrectomy for renal tuberculosis, is presented. The patient complained of weakness, dizziness on changing positions, and headaches with nausea. There was a presumptive diagnosis of hypothyroidism, and thyroxin given daily gave only slight relief. Liver injections had been given for anemia. Examination revealed an enlarged left kidney and a diagnosis of renal tuberculosis was made. A left nephrectomy was done, after which the blood pressure dropped markedly. Cortical extract was given for suspected adrenal insufficiency. The pathological diagnosis was ascending tuberculous pyelonephritis. Because of collapse, cortate and salt were given daily, the cortate being continued. Addison's disease was suspected. Abdominal roentgenograms revealed bilateral adrenal calcification. Improvement occurred with desoxycorticosterone acetate (DOCA) and salt. After one year the former symptoms returned and he was eventually put on a regimen including salt and implantation of pellets of percortin.

Concurrent complicating diseases may mask signs of cortical insufficiency. Latent or atypical adrenal cortical insufficiency should be considered in cases of urogenital tuberculosis, especially where surgery is contemplated. 26 references.

THE NATURE OF THE ALTERED RENAL FUNCTION IN LOWER NEPHRON NEPHROSIS.

Daniel Marshall and William S. Hoffman, Cook County Hospital, Chicago, Ill. J. Lab. & Clin. Med. 34:31-39, January 1949.

Serial determinations of clearances of mannitol, p-aminohippurate, urea, and creatinine, and of tubular excretory mass were carried out in 3 subjects in the phase of diuresis and recovery from lower nephron nephrosis. In addition, urine-plasma ratios of nonprotein nitrogen were followed in these and 3 other patients with lower nephron nephrosis during their whole course of illness. With these data it was possible to extrapolate back to the period of oliguria and recognize the general nature of the functional alteration.

In 2 subjects, the first function tests gave negative values for tubular excretory mass and impossibly high values for filtration fraction and ratio of p-aminohippurate clearance to tubular excretory mass. In subsequent tests these distortions disappeared, but the absolute values for clearances remained lower than normal. Complete restitution of renal function to normal did not occur until 3 to 7 months had elapsed.

At the beginning of diuresis, the concentration ratio of nonprotein nitrogen remained as low as during the oliguria period. After several days of diuresis, the concentration ratio began to rise steadily even as the urine volume increased, indicating improvement in tubular function.

These data are consonant with the idea that the functional renal lesion in lower nephron nephrosis is a diminished renal blood flow in association with a loss of specific function of the lower nephron. Consequently, the limited amount of modified glomerular filtrate reaching the lower nephron is almost completely resorbed. A gradient diffusion through the damaged cells appears to be present which allows a greater resorption of p-aminohippurate than of mannitol and which is thus responsible for the distorted renal clearance tests. Recovery seems to be produced first by an increase in effective renal blood flow, followed later by a repair of tubular function. The gradient diffusion is apparently the first tubular defect to disappear. The total recovery of normal specific tubular function is much slower. 9 references. 2 tables. 4 figures.—*Author's abstract.*

CAN VASCULAR SHUNTING BE INDUCED IN THE KIDNEY BY VASOACTIVE DRUGS?

Francois C. Beubi and Henry A. Schroeder, Washington University School of Medicine, and Barnes Hospital, St. Louis, Mo. J. Clin. Investigation, 28:114-23, January 1949.

Determinations of sodium para-amino hippurate (PAH) mannitol, oxygen content and hematocrit in renal venous and peripheral (or renal) arterial blood before and after injection of epinephrine, histamine or pentothal were carried out in patients, 6 of whom were normotensive and 8 hypertensive. Determinations were also done in 15 dogs. Renal venous blood in patients was obtained by catheterization of the right renal vein.

There was an 11.4% maximal decrease in the extraction of PAH in the human kidney after subcutaneous injection of epinephrine or histamine; results were inconclusive in dogs. Arteriovenous oxygen differences in 2 patients were increased by epinephrine; they were decreased in 3 patients.

There was a consistent difference in dogs in the oxygen capacity, hematocrit, and plasma protein content between renal arterial and renal venous blood; the latter was more concentrated. Epinephrine increased this difference. This loss of fluid from the renal blood may possibly have occurred through renal lymph vessels or other vascular channels by-passing the renal vein.

It is concluded that large intermittent renal shunts are not elicited in man by physiological doses, or in dogs by larger doses, of epinephrine. Even in patients with essential hypertension, histamine or epinephrine caused relatively small and inconsistent changes ascribable to the presence of shunts. 27 references. 3 tables. 3 figures.

THE TREATMENT OF ANURIA.

D. A. K. Black and S. W. Stansbury, Royal Infirmary, Manchester, England. Brit. M. J. 4590:1101-105, Dec. 25, 1948.

Theories of the mechanism of anuria fall into two main groups:—those which emphasize circulatory impairment and a consequent decrease in

glomerular filtration; and those which attribute most blame to the tubules, suggesting that "lower nephron nephrosis" may be associated with massive unselective absorption of the fluid in the tubular lumen. It is probably a mistake to separate these mechanisms too sharply, for glomeruli and tubules are interdependent structures, especially in their circulation. In particular, the evidence for one or other theory is at present not strong enough to warrant neglect of the other in practical treatment.

On this theoretical basis, it is suggested that as soon as anuria develops, apart from organic renal disease, the attempt should be made to increase, or possibly to redirect, the renal circulation by splanchnic block, or high spinal anesthesia; occasional successes have seemed to follow such methods. Medical methods of "sympathetic block" by sympatholytic drugs deserve further trial. Such attempts should be made early, but will fail in many cases to restore urine flow. The object of treatment then becomes the conservation so far as possible of an optimum physical and chemical state of the body fluids, until such time as spontaneous healing in the kidneys allows urine formation to occur again. A diet which is adequate in calories, but of minimal protein content, is indicated; the salt intake should also be minimal, as the urinary excretion of salt is in abeyance. In order to eliminate urea and other waste products, we may use the artificial kidney, peritoneal or intestinal lavage.

The case of a patient is described to illustrate some of the points in treatment. After a failure of spinal anaesthesia to restore urine flow, a two-way tube was passed into the small bowel, and dialysis made with hypertonic sodium sulphate. In this way, more than 15 Gm. of urea were removed, and the blood urea was lowered. The next day, by coincidence, urine flow began again. It is important with this form of treatment to restore, overnight, enough electrolyte to replace that lost by dialysis through the day; and also to prevent potassium depletion, which may cause sudden death from cardiac failure even after the urine flow is re-established. 22 references. 1 table. 1 figure (chart).—*Author's abstract.*

STUDIES ON AN ARTIFICIAL KIDNEY: I. PRELIMINARY RESULTS WITH A NEW TYPE OF CONTINUOUS DIALYZER.

Leonard T. Skeggs, Jr., Crile Veterans Administration Hospital, Parma, Ohio, and Jack R. Leonards, School of Medicine, Western Reserve University. Science, 108:212-13, Aug. 27, 1948.

A new type of continuous dialyzer for the removal of retained metabolic waste products from the body in acute renal insufficiency is described. This consists of a varying number of units connected in parallel, and each consisting of a single sheet of cellophane between 2 rubber pads each 12 by 18 by 1/4 inches. The pads are coated with a non-wetting film of silicon resin to retard clotting. The inner surfaces of the rubber pads are finely grooved, those on 1 pad acting as vessels through which blood flows under arterial or other pressure and those on the other pad for dialyzing solutions moving in the opposite direction. A single kidney unit may therefore be connected with as many similar units as desired by interconnecting passages within the

rubber pads. The units are firmly held together between 2 flat steel plates tightened at the edges by thumbscrews. The entire apparatus may be sterilized by autoclaving. Each kidney has a surface area of 840 cm. for dialysis, contains 45 ml. of blood, and can remove 0.5 Gm. of urea nitrogen/hour from a blood urea nitrogen level of 150 mg./100 ml.

A series of 5 bilateral nephrectomized dogs were successfully dialyzed by this method, using heparin as an anticoagulant. The blood urea nitrogen was definitely decreased and appreciable amounts of urea removed in each case. There was a tendency for animals, whose acid-base balance was disturbed, to return to normal. No harmful effects followed this procedure and several cases improved clinically but test animals were not kept alive significantly longer than controls.

These studies indicated that this continuous dialyzer should be useful both in the laboratory and as an artificial kidney. Efficient dialysis is produced because it has a large dialyzing surface compared to the amount of contained solutions, and the fluid on both sides of the Cellophane are in a thin film rapidly moving countercurrent to each other. 16 references. 1 table. 1 figure.

MANAGEMENT OF ACUTE NONOBSTRUCTIVE RENAL INSUFFICIENCY.

H. Evans Leiter, Irving G. Kroop, A. Fishman and Abraham Hyman, Mount Sinai Hospital, New York, N. Y. J. Urol. 61:163-71, February 1949.

Recovery from acute renal insufficiency is determined by the power of the kidney to resume adequate function and upon the success in artificially maintaining the physiological balance of various equilibria. Experiences in cases of acute renal shutdown are presented.

The treatment of anuria or severe oliguria is divided into 3 phases. In the early phase, BAL in bichloride of mercury poisoning has improved the prognosis. Antibiotics may control infections which cause lower nephron nephrosis. Clinical shock should be prevented or combated early. Prerenal deviation is treated with parenteral fluids containing the lost electrolytes. Isotonic sodium sulfate may be useful for intravascular hemolysis. Renal anoxia should be avoided. Paravertebral novocaine block is said to counteract renal vasospasm.

In the phase of persistent oliguria or anuria, the fluid and electrolyte balance in the extracellular fluid should be maintained. Excessive perspiration or gastrointestinal loss must be supplemented. Oral liquids are preferred. Sodium chloride is given cautiously unless depleted by vomiting. A diet consisting almost entirely of fruit juices provides additional base. A low protein diet improves the prognosis of renal insufficiency.

Dialysis is a valuable adjuvant to remove products of catabolism from the extracellular fluid. It is ideal to remove nonprotein nitrogen from the blood. Internal dialysis includes: continuous gastric lavage; irrigation of one isolated loop of small bowel; irrigation and suction through a two-way tube placed orally into the small bowel; and peritoneal lavage. External

dialysis is a method where blood is circulated outside the body in a dialyzing system and includes artificial kidneys. Dialysis is useful when blood urea nitrogen is high, the patient is in fair condition, and expected time of renal recovery is several days away.

The phase of recovery is marked by progressive increase in urinary output. There is a large loss of electrolytes in the urine. Unless there is sodium chloride retention, salt may be necessary to replace its own loss in the urine. Frequent small transfusions combat the anemia. Diarrhea is frequent. Fluid intake, loss, and body weight are recorded daily. Blood is examined daily for urea nitrogen, chloride and carbon dioxide. Renal decapsulation is said to be useful especially in the tense, edematous kidney. 33 references. 2 tables, 3 figures.

SULFATHIAZOLE ANURIA CURED BY MEANS OF INTRAVENOUS PROCAINE TREATMENT.

Niels Peer Friis, Copenhagen, Denmark. J. Urol. 61:184-86, February 1949.

Acute anuria may be a complication of several disorders, and the most effective treatment until recently has been early bilateral renal decapsulation, with a moderate restriction of fluid intake.

A case is reported in which anuria developed during sulfathiazole treatment for bronchopneumonia, after 15 Gm. of the drug had been taken. The anuria had been present for twenty-three hours when 5 cc. of 1% procaine hydrochloride was given by slow intravenous injection: as this caused no untoward reaction, 10 cc. of the procaine solution was given intravenously. A small quantity of urine containing blood was passed two and a half hours later, and in the next sixteen hours 250 cc. of urine were passed. Another injection of 10 cc. of the procaine solution was given and still another injection. When diuresis was first started the urine contained albumin and blood, but during the first forty-eight hours the amount of urine passed increased progressively and the albumin and blood disappeared. In the course of a week the patient's blood urea had fallen to normal levels. During treatment, sodium bicarbonate was given and fluid intake was moderately restricted to 1300 to 1500 cc. daily. Penicillin was given for the bronchopneumonia, and the patient made an excellent recovery. Subsequent x-ray examination showed the urinary tract to be entirely normal.

The first case in which intravenous procaine was used in the treatment of anuria was reported in France, by May, Netter and Gerbaux in 1943. The author has previously reported a case of anuria calculosa treated by intravenous procaine; and a third case has recently been reported by Langeron, Paget and Michaux, which was also a case of anuria due to sulfathiazole. The effect of the procaine treatment is attributed to a transient blocking of the sympathetic, possibly with direct action on the renal functions. 7 references. 1 figure.

ACCELERATORY EFFECTS ON RENAL FUNCTION.

H. Silvette and S. W. Britton, University of Virginia Medical School, Charlottesville, Va. Am. J. Physiol. 155:195-202, Nov. 1, 1948.

Experiments were made in rats to investigate possible renal changes in structure and function following exposure to different positive and negative acceleratory forces. Ample fluid for secretion was provided by giving all animals 7.5 cc. of 0.5% sodium chloride solution per 100 Gm. of body weight. The urinary bladders were emptied after two hours by gentle pressure massage and the animals tied down on boards in groups as indicated. Various groups were centrifuged at 2 to 5 *g* under different conditions. Controls were tied down but not accelerated. Several groups were exposed to various positive and negative forces over periods of eight to twenty-four days. The accelerator exposures in these experiments were greater than those usually experienced by man but were not critical for rats. All animals were in excellent condition after the tests, even when accelerated daily for a few weeks.

The volume of urine after centrifugation was increased to 40% above normal for five or six hours and the chloride concentration reduced below normal. Administration of post-pituitary extract reversed or inhibited acceleratory polyuria. Albumin was present in the urine and significant pathological changes developed in the kidney after repeated daily exposures to acceleration for about three weeks.

Results of these experiments showed that rats exposed to low barometric pressure, equivalent to an altitude of 25,000 ft., had much more polyuria than those exposed to high accelerator forces. Pathological renal changes were also different, kidneys of high-altitude rats being greatly hypertrophied with congested glomeruli and little tubular pathological changes, while the kidneys of *g*-exposed rats showed little, if any gross renal disease. It is difficult to correlate the pathological changes with the functional changes found after repeated acceleration. The latter, however, seemed referable to both glomerular and tubular impairment resulting from a disturbed renal circulation caused by the high acceleratory forces with resulting anoxia of renal intimate tissues. Cortico-adrenal and post-pituitary functions may be involved. 3 references. 4 tables. 4 figures.

RENAL EXCRETION OF WATER AND ANTIDIURETIC SUBSTANCES IN PATIENTS WITH HEPATIC CIRRHOSIS AND RATS WITH DIETARY LIVER INJURY.

Charles A. Hall, Boy Frame and Victor A. Drill, New Haven, Conn. Endocrinology, 44:76-82, January 1949.

Assays for antidiuretic substances were performed on the urines from 4 patients with hepatic cirrhosis and ascites, and from 4 normal subjects. Similar assays were performed on the urines from rats with fatty and fibrotic livers which had been produced by a high fat diet, and from rats with normal livers. The liver injury produced was of a severe grade. In addition, water

tolerance tests were performed on all of the animals.

The urines from patients with cirrhosis had an antidiuretic activity approximating that which was obtained with 5 milliunits of pituitrin while the urines from normal subjects had no antidiuretic activity. Urines from the rats on a high fat diet with liver injury, from rats on the same diet but with the liver protected by dietary supplements, and from rats on a normal fat diet all showed antidiuretic activity of similar magnitude. The water tolerance tests failed to show any difference in water retention between the animals with liver injury and those with normal livers.

It is pointed out that while the findings with patients with cirrhosis are in agreement with those of previous studies, the findings with the animals with liver injury are not. Possible reasons for the disagreement are discussed. 8 references, 3 tables, 2 figures.—*Author's abstract.*

RESPONSE TO PARENTERAL GLUCOSE OF NORMAL KIDNEYS AND OF KIDNEYS OF POSTOPERATIVE PATIENTS.

Donald R. Cooper, Vivian Iob and Frederick A. Coller, University of Michigan Medical School, Ann Arbor, Mich. Ann. Surg. 129:1-13, January 1949.

The inadvisability of inflicting heavy loads of sodium chloride upon the early postoperative patient has been pointed out in previous reports. A definite variation from the normal handling of the infused salt loads was demonstrated for patients undergoing combined abdominoperineal resection for carcinoma of the rectum. The present report cites similar studies using infusions of 5% glucose in an effort to clarify further the problems connected with the proper hydration of the early postoperative patient.

Data are presented of the urinary response to small, positive loads of parenteral 5% glucose, 1 to 1.5% of body weight, in normal men and in patients following operations of varying magnitude. Infusion studies were carried out on 3 healthy young men (group I), 4 patients undergoing herniorrhaphy (group II) and 5 patients having combined abdominoperineal resection for carcinoma of the rectum (group III). Rates of excretion of sodium, chloride, potassium and water, and velocity constants of water were calculated for each of the 3 groups of patients.

Detailed urinary findings for four or five six-hour periods emphasize a diuretic response in group I, a delayed tendency toward diuresis in group II and oliguria for group III. Effective control of water, potassium, sodium and chloride losses in the controls did not occur until the second, third, or more often the fourth periods. In group II diuretic response was the exact opposite so far as urine volume was concerned and occurred usually during the fourth and fifth periods (24 to 30 hours after operation). Group III was characterized by no diuretic response and a positive load of water. Urinary specific gravity remained low in spite of small urinary volumes. Whole blood and serum changes revealed a tendency toward hemoconcentration for group I and hemodilution in group III, with little change in group II. This emphasized again the contrast between the dehydration which occurred in group

I and the positive water loads apparent in the group III patients.

A second series of patients undergoing combined abdominoperineal resection who received transfusions in addition to glucose presented the same picture of oliguria and urines of low specific gravity.

Some of the causative factors associated with these differences in the handling of 5% glucose are discussed. Further data are presented which show that the addition of either adequate blood replacement during operation or infusions of large volumes of glucose in the early postoperative period are without influence upon the oligurias noted in those patients undergoing large operations.

During the first six to twelve hours after operation, it is recommended that intravenous infusions be limited to transfusions of blood to replace blood loss and to that amount of 5% glucose required to replace insensible loss of water. After this period and following a careful evaluation of the patients' state of hydration, sufficient 5% glucose may be infused to support renal function adequately. 8 references, 7 tables, 1 figure.—*Author's abstract.*

(*The use of blood transfusions during the first six to twelve hours after operation, instead of saline infusions, is a very valuable addition to our conception of postoperative balance.—J. H. F.*)

TWO UNUSUAL CAUSES OF RENAL HEMATURIA.

Hamilton W. McKay, H. Haynes Baird and Kenneth M. Lynch, Jr., Charlotte, N. C. J. Urol. 61:1-10, January 1949.

Two cases of intractible, painless, unilateral hematuria in which nephrectomy was performed are reported.

Case 1 was found to have a minute lesion near the tip of one pyramid which was diagnosed as an hemangio-hamartoma. The literature on vascular irregularities of the kidney resulting in hematuria is reviewed, 18 cases of renal varix and 54 cases of angioma being noted.

Case 2 was found to have a focal, partially necrotizing pyelonephritis in isolated calyces, in one of which there was a small deep ulcer. Reported urine cultures in this case were negative. A review of the literature discovered only a few similar reported cases, some of which were referred to as chronic hemorrhagic papillitis.

We are convinced that nephrectomy is the treatment of choice in those cases in which the bleeding is unilateral, persistent, and of a serious nature, granted that attempts have been made to stop the bleeding by instillation of caustics such as 1% silver nitrate into the kidney pelvis, by administration of vitamin K, and perhaps x-ray therapy. Some authors believe that this practice may be dangerous, however, in that the bleeding of early malignancies may respond to this treatment and be disregarded. If this treatment is used, the patient should be followed by periodic pyelography with malignancy in mind. Various types of nephrotomy, from a small incision where a finger is introduced, to pole to pole deep incision, have been used by many of the reporting authors and frequently with success. We believe, however, that the risk of overlooking early malignancy is a ponderable one in such a procedure.

Papillectomy in cases where the offending papilla is visualized may be considered by many as a satisfactory procedure. However, in a number of reported cases more than one papilla is involved and one may be easily overlooked, inasmuch as visualization of all the papillae requires not only a complete midline incision but assessory incisions up many of the calyces. Secondary hemorrhage is also a risk to be considered in this procedure, and MacGowan who performed three papillectomies strongly recommends nephrectomy as a safer procedure. We believe, therefore, that nephrectomy and papillectomy are inadequate and do not recommend them. One must always consider the opposite kidney, however, and where there is some lesion causing impaired function, all kidney tissue must be assiduously conserved. 21 references. 5 figures.—*K. M. Lynch, Jr.*

UROLOGIC INVESTIGATION OF ABDOMINAL MASSES.

William J. Engel, Cleveland Clinic, Cleveland, O. S. Clin. North America, 28: 1193-1208, October 1948.

It is not possible to make a correct diagnosis as to the true nature of an abdominal mass from physical examination alone. Complete urological investigation contributes valuable information in establishing a proper diagnosis. In addition to a careful history and physical examination, this should include complete urine examination, a plain roentgenogram of the abdomen, and an intravenous urogram. In many cases cystoscopy with ureteral catheterization and retrograde pyelography will be necessary. All masses fall into three categories: I. Intraperitoneal masses. II. Extraperitoneal (retroperitoneal) masses not arising from the kidney. III. Masses of renal origin.

I. Intraperitoneal masses may be of many types. They often appear in the lateral portion of the abdomen and must be differentiated from kidney. The intraperitoneal location is established when pyelographic study excludes the kidney or other retroperitoneal mass.

II. Retroperitoneal extrarenal tumors have different points of origin. One group of special interest are those which arise from embryonal remnants of the urogenital tract. They may be solid or cystic and often attain great size. They displace the kidney and may produce compression and distortion of the renal pelvis. This is to be differentiated from true deformity which is produced only by tumors of renal origin. The lateral oblique pyelogram (patient at about a 60° angle to table) adds helpful information and its use is recommended. Ureteral displacement is seen only in retroperitoneal masses. Irregular serpentine displacement suggests metastatic malignancy, such as occurs with testicular neoplasms. Adrenal tumors and those of embryonal neurogenic origin are encountered occasionally. Perinephric abscess produces renal fixation, which may be demonstrated by means of a respiration pyelogram.

III. Palpable masses of renal origin cover a variety of pathological lesions which can only be diagnosed by careful urological investigation, including pyelographic study. Commonly encountered are tumors, cysts, hydro-

nephrosis or pyonephrosis and polycystic disease. The latter should always be suspected when bilateral masses are present.

Illustrative cases are presented, a study of which yields several clinical aphorisms: (1) A normal pyelogram immediately excludes a retroperitoneal mass; (2) Ureteral displacement indicates a retroperitoneal mass; (3) Renal displacement denotes retroperitoneal tumor; (4) Distortion of the renal pelvis may be produced by extrarenal masses; and (5) True deformity of the renal pelvis always indicates an intrinsic kidney lesion. 1 reference. 14 figures.

—*Author's abstract.*

CONGENITAL HYDRONEPHROSIS IN THE HOODED RAT.

Robert J. Faulconer, Johns Hopkins University, Baltimore, Md. Anat. Rec. 103:69-75, January 1949.

A rare case of congenital hydronephrosis in the McCollum hooded strain of rat is described. This is the only case in which such an anomaly was found in several thousand autopsies on hooded rats. Hain and Robertson proved the hereditary nature of urogenital anomalies in inbreeding of a colony with this recessive trait, and the Hopkins colony had been inbred for about eight years. The chief anomalies found in the Hain-Robertson colony were renal agenesia, renal hypoplasia, hydronephrosis, and a genital anomaly with no associated renal defect. They always developed on the left side and were believed the result of unequal growth between the two sides.

In the reported case, a much dilated, thin-walled hydronephrotic sac was found to have replaced the right kidney in a 22 day old female rat. It contained a clear fluid resembling urine. The right ureter was thin-walled, dilated from kidney to bladder, tortuous and also contained considerable fluid. Serial sections at the junction between the hydro-ureter and bladder showed that it ended blindly. The left kidney was normal. This condition is considered of random secondary embryologic origin with no genetic significance. It is possible that the ureteral orifice, which was originally connected with the wolffian duct, becomes occluded before it reaches the bladder lumen by the atrophy of the wolffian duct. This would explain the more frequent occurrence of this anomaly in females. 6 references. 1 table. 1 figure.

BRANCHED RENAL CALCULI.

James T. Priestley, Mayo Clinic, and J. Hartwell Dunn, Mayo Foundation, Rochester, Minn. J. Urol. 61:194-203, February 1949.

A study was undertaken for the purpose of evaluating clinical experience in the treatment of patients in whom a branched type of renal calculus was present in one or both kidneys. A group of 382 patients seen at the Mayo Clinic in the years 1927 through 1940 have been reviewed.

Treatment of the patient who has a branched renal calculus presents a difficult problem, especially if stones of this type are present in both kidneys. Oftentimes, if there are no compelling symptoms present, the patient may not appreciate the threat that exists to renal function, and even his

physician may permit the most opportune time for surgical treatment to pass while employing "conservative" treatment. The fallacy of this management is readily apparent when it is realized that progressive renal damage always occurs when a branched type of calculus is present. Sometimes this is a gradual, long drawn out process but other times it is more rapid. The term "silent renal stone" is an unfortunate designation as it implies that such a calculus is a dormant entity of little significance. Obviously the most important consideration in the management of the patient who has a branched type of stone is the preservation of renal function. A greater opportunity to preserve renal function exists early, rather than late, in the course of the disease.

To evaluate late results, it was necessary to divide the entire group of patients into three categories; namely, (1) those who had a branched stone in one kidney; (2) those who had a branched stone in one kidney and an unbranched type of stone in the other kidney; and (3) those who had branched stones in both kidneys. These three groups are considered individually in the discussion of treatment and results.

In general, patients who had a branched stone in only one kidney obtained the best results and those who had bilateral branched stones obtained the least satisfactory results. Patients who had a branched stone on one side and a smaller or unbranched stone on the other side had results which were midway between those of the other groups. Seventy-eight per cent of patients who had unilateral branched stones, 64% of those with unilateral branched stone and an unbranched stone on the other side, and 45% of those with bilateral branched stones were alive ten years after treatment. For those who had a unilateral branched stone, conservative operations for removal of the calculus or nephrectomy gave the best results. Likewise, for those who had bilateral calculi, the best results followed conservative surgical procedures. It is realized that the results cannot be attributed completely to the type of treatment given, as some patients were in too poor condition when they were first examined to permit any operative treatment. In general, however, the results of surgical treatment are superior to the results which follow nonoperative management. 10 references. 4 tables. 4 figures.—*Author's abstract.*

SOLITARY CYST OF THE KIDNEY WITH HYPERTENSION

James F. Brunton, Hamilton, Ont., Canada. Canad. M.A.J. 60:68-70, January 1949.

An ex-service man of 26 years complained of persistent frontal headache. The blood pressure was 190/126. The physical examination otherwise was negative. Genitourinary investigation revealed calcifying cyst of the upper two thirds of the right kidney. Improvement followed a right nephrectomy. The headaches did not recur. Sixteen months later the blood pressure was 128/88. No arteriosclerosis was seen on microscopic examination of the kidney sections. Hypertension had been present for two years prior to the nephrectomy. 4 references. 1 figure.—*Author's abstract.*

UNILATERAL MULTIPLE CYSTS OF THE KIDNEY.

Charles P. Howze and John H. Hill, Washington, D. C. J. Urol. 61:187-93, February 1949.

One case of unilateral multicystic kidney in a 20 day old male and a second case in a 13 year old male are described. In Case 1, there was a mass in the left side of the abdomen and absence of the left testicle. The mass filled the entire left side of the abdomen. A plain roentgenogram showed a soft tissue mass in the left flank about the size of an orange. Excretory urograms showed dye only in the right kidney. A Wilms' tumor was considered and surgery was done. The right kidney was found to be normal. Behind the posterior peritoneum was a multicystic mass extending from under the diaphragm to the pelvic brim. The tumor was found to consist of multiple cysts. There was no renal tissue apparent. The mass was attached to a ureter. The left testicle, which was found adhering to the mass, was removed with the tumor. Recovery was uneventful. The pathological diagnosis was congenital multicystic kidney; atrophic testicle.

In Case 2, a 13 year old Negro boy complained of fever, chills, and sweats for three weeks. There was some pain in the lower right quadrant and hematuria on several occasions. A mitral murmur and accentuated pulmonic second sound were detected. The urine had a trace of albumin. Blood smears were positive for Plasmodium vivax. Roentgenograms showed no urinary calculi. No dye was found to be excreted by the right kidney. Upon cystoscopy the catheter was obstructed at the 10 cm. mark and no urine was obtained from this right side. Operation was performed. There was no kidney in the lumbar fossa. A small multicystic mass, the size of an oyster, was discovered in the iliac fossa, attached to the peritoneum. There was no apparent renal pedicle. The mass was attached to a small ureter which was divided and ligated. Recovery was uneventful. The pathological diagnosis was multicystic kidney with fibrosis. 16 references, 1 table, 3 figures.

MESOBLASTIC NEPHROMA IN ADULTS. A CLINICO-PATHOLOGIC STUDY OF WILMS' TUMORS AND RELATED RENAL NEOPLASMS.

Ormond S. Culp and Frank W. Hartman, Henry Ford Hospital, Detroit, Mich. J. Urol. 60:552-76, October 1948.

More than 50 different pathologic diagnoses have been used to describe cortical renal tumors which seem to be closely related and of embryonal derivation rather than distinct morphologic entities. Embryonal tumors of the kidney were divided into (1) cortical, derived from the mesoblast, and (2) pelvic, of mesonephric origin. The former group formed the basis for this study which was confined to patients at least 16 years of age. These tumors were found to be (a) mixed cell type, (b) carcinoma, (c) sarcoma or (d) undifferentiated.

Four mixed tumors were cited from the Henry Ford Hospital. Ninety-seven similar tumors were collected from the literature. These occur at any

age, in both sexes, in either kidney. Usually they are very malignant, tend to recur after either lumbar or transperitoneal nephrectomy, metastasize to lymph nodes, lungs and liver most frequently, cannot be distinguished from other kidney tumors clinically, are influenced very little by irradiation, and usually cause death within twelve months of diagnosis and treatment. Only 10 surviving patients could be found in the literature after further personal communications.

All embryonal cortical tumors were thought to be actually or potentially mixed cell tumors but occasionally the carcinomatous or sarcomatous cells dominated the histologic picture completely. Three embryonal carcinomas were reported from the author's series. Eighteen similar cases were found in the literature.

One embryonal sarcoma was reported from the Henry Ford Hospital. Of 114 renal sarcomas in adults which were found in the literature, 30 were thought to fall into this category. The others were elminated because of incomplete data or obvious origin in the renal capsule. The embryonal carcinomas and sarcomas behaved like the mixed cell tumors and differed only in cellular structure. Undifferentiated tumors were rare, inasmuch as most of the highly malignant neoplasms could be identified as carcinoma, sarcoma or mixed. The 8 cases reported by the authors represented varying degrees of malignancy but only 2 had survived (18 and 24 months, respectively). It is suggested that all of these tumors be called mesoblastic nephromas and that more complicated pathologic terms, as well as the name Wilms' tumor be avoided. Further differentiation adds to the chaotic state of the literature. 144 references. 9 tables. 19 figures.—*Author's abstract.*

CROSSED UNFUSED RENAL ECTOPIA WITH TUMOR.

Harry P. Lee, Spokane, Wash. J. Urol. 61:333-39. February 1949.

Crossed, unfused renal ectopia, a congenital condition in which a kidney is transposed to the side of the body opposite to its normal location but remains unattached to its normally placed mate, is a rare anomaly, making up about one tenth of all crossed renal ectopiae. The embryology has remained unexplained. About half of the cases have been found in cadavers, evidently having caused no trouble during life; the remainder have been discovered as abdominal masses or have developed pathological conditions leading to urological investigation and diagnosis.

Alcock, in 1926, and Mayers, in 1936, tabulated cases. Mayers also gives an excellent discussion of the embryology, incidence and surgery of these cases. Including the author's case, 29 cases have been found. Two of these contained adenocarcinomata. The author's case contained a squamous cell carcinoma, probably primary in the pelvis but involving the entire kidney.

The case reported was that of a 41 year old white woman who had had urinary frequency and a mass in the left lower abdominal quadrant for four or five years. For one year she had had severe pain in the buttocks and

back of thighs. Urological examination revealed a normal left kidney but the right kidney was found to be lying in the left side of the bony pelvis, its ureter arising in normal position in the bladder and crossing over the midline to a pyonephrotic pelvis. Nephrectomy was done through a left rectus incision. After removal, the kidney was found completely involved with a squamous cell carcinoma. The patient made a normal recovery but died about one year later, apparently with generalized abdominal metastases. 16 references. 1 table. 2 figures.—*Author's abstract.*

HYPERNEPHROMA METASTATIC TO THE THYROID GLAND. REPORT OF A CASE.

G. Rhemi Denton and John C. McClintock, Albany Medical College, Albany, N. Y. Ann. Surg. 129:399-403, March 1949.

Hypernephroma metastatic to the thyroid gland is so rare that only 20 cases are reported in the literature up to 1947. The two most complete reviews are by Linton, Barney, Moorman and Lerman in 1946 and Boys in 1947. The following case report is presented:

The patient, a man aged 48 years, was admitted to Albany Hospital on April 7, 1942, with a chief complaint of fatigability, weight loss and the presence of a lump in the neck of five months' duration. He became exhausted within one hour after arising in the morning. Although his appetite was good he had lost 20 pounds in weight. He had nocturia three times per night. Eight years previously the patient had had a right nephrectomy for hypernephroma. During convalescence, deep x-ray therapy was given elsewhere. He was symptom-free eighteen months after the nephrectomy and remained so during frequent checks in the out patient clinic until five months before the second admission. Physical examination revealed the right lobe of the thyroid to be enlarged, nodular and pushing the trachea to the left. The left lobe was only slightly enlarged. X-rays of the chest revealed no metastases to the lungs.

The diagnosis was nontoxic nodular goiter with possibility of metastatic hypernephroma considered. A bilateral subtotal thyroidectomy was performed, with removal of hypertrophied gland containing many small adenomata. The pathological diagnosis was adenomatous colloid goiter; metastatic clear cell carcinoma of renal origin. The patient's family doctor reported his death thirteen months after thyroidectomy and nine years after removal of the renal tumor. Shortly before death a mass the size of two fists is reported to have appeared in the left side of the abdomen. A postmortem examination was not done.

Because of the limited number of cases in the literature no conclusions can be drawn. However, metastatic hypernephroma must be seriously considered in those patients who develop goiter following a diagnosis of hypernephroma. These metastases may occur as late as thirteen years after excisions of the orginal renal tumor. 18 references. 1 table. 2 figures.

—*Author's abstract.*

REPORT OF POSTOPERATIVE SURVIVAL OF TWO CASES OF MALIGNANCY: 1) CARCINOMA OF THE ADRENAL CORTEX; 2) WILMS' TUMOR IN AN ADULT.

Martin J. Loeb, Bronx Hospital, New York, N. Y. J. Urol. 61:20-22, January 1949.

The two cases were reported in the Journal of Urology (vol. 45, p. 785 and vol. 50, p. 268 respectively).

The first case is that of a woman, 57 years old, who was ill for two years before admission to the Bronx Hospital, Nov. 11, 1939. The patient presented the usual triad of symptoms of malignancy: (1) a large mass which occupied the right side of the abdomen extending from behind the costal cartilages to the pelvis; (2) loss of weight, about 40 pounds; and (3) general weakness.

Cystoscopy, pyelograms and perirenal insufflation disclosed a large mass which was not connected with the right kidney. On operation a large adrenal carcinoma which weighed 1100 Gm. was removed. The tumor extended over the spinal column to the left over the aorta, which made the operation a difficult technical procedure.

On microscopic section the tumor was diagnosed as carcinoma of the adrenal cortex. The tumor cells comprised solid masses which often were the seat of hemorrhagic necrosis. The patient was subjected to radiation therapy.

Immediately after operation the patient improved. She regained her strength and loss of weight. She was able to attend to her usual housework including the care of a large family. Nine and one-half years after her operation the patient is still in an excellent condition.

This case is the longest reported survival of a cortical carcinoma of the adrenal.

Case 2, the second case is that of a woman 49 years old, who was admitted to the hospital in November 1941. For one year she had symptoms referable to the right lumbar region. One week previous to admission the patient began to have sudden pains in the right lumbar region radiating to the groin, with severe hematuria.

Cystoscopic examination and x-rays revealed a normal left kidney. The right kidney was functionless, bleeding, and presented distortion of the calyces and communication with an area in the kidney. A diagnosis of carcinoma of the kidney was made. A nephrectomy was performed, followed by radiation therapy.

Microscopic examination gave the general appearance of a sarcoma of spindle-cell variety with interspersed areas of smooth muscle cells. Other portions of the tumor revealed tubule-like formations. The microscopic diagnosis was that of an adenomyosarcoma (Wilms' tumor).

Recent physical examination and x-ray revealed the patient to be in excellent physical condition with the exception of a mild diabetes which she developed several years ago. This patient is well seven and one-half years after her operation. 0 references.—*Author's abstract.*

MANAGEMENT OF THE INJURED KIDNEY. PRELIMINARY REPORT.

Kenneth M. Lynch, Jr. Memorial Hospital, Charlotte, N. C. J. Urol. 61:371-80, September 1948.

Twenty-three cases of injury of the kidney from the Urological Service of the Charlotte Memorial Hospital were analyzed statistically in regard to etiology, symptomatology, and presenting signs. All acute ruptures of the kidney were found to complain of severe pain, to have acute tenderness and rigidity of the flank, and, in 31 % of the cases, to have a palpable mass. Mortality figures were given. Operations performed in 7 cases were listed and one repair using hemostatic oxycellulose gauze was described. Late sequelae of renal injury were presented and discussed. Intravenous urography and retrograde pyelography were urged for complete and accurate evaluation of a case of suspected renal injury. The bugaboo of retrograde pyelography was discussed. Exploration in all cases in which there is extravasation of intravenous or retrograde dye or obliteration of the renal and psoas shadows was advocated. Seventy-two hours was arbitrarily set as the ideal time to explore the kidney, unless severe hemorrhage and shock should require immediate operation. 11 references. 6 figures.—*Author's abstract.*

10. Ureter

UNUSUAL URETEROGRAMS IN A CASE OF PERIARTERITIS NODOSA.

Russell S. Fisher and Herbert H. Howard, Boston, Mass. J. Urol. 61:398-404, September 1948.

A case of periarteritis nodosa in a 13 year old girl is described. The features of interest are the extensive and unusual involvement of the ureters, and the extraordinary and perhaps pathognomonic ureterograms associated with this localization of the inflammatory lesions. The clinical course was that of acute abdominal pain, migratory joint pains, maculopapular rash on the extremities, spiking fever with chills, vomiting, and uremia with terminal intestinal obstruction. The diagnosis was established by pathologic examination of the appendix removed at exploratory laparotomy. The genitourinary examination failed to show costovertebral angle tenderness but disclosed 2+ albuminuria and 4 to 5 pus cells in each high power field. Intravenous ureterograms on 2 occasions showed marked spasticity with moderate dilatation of the upper thirds of both ureters, and the 60 minute films revealed considerable concentration of dye within both kidneys and both ureters.

At postmortem examination, the kidneys and the ureters exhibited widespread involvement by typical vascular lesions of periarteritis nodosa. An unusual feature was the presence within the same microscopic fields of vascular lesions of stages varying from early acute inflammation with intimal necrosis and cellular exudation, to the healing stages characterized by marked

proliferation of mural elements.

Fourteen cases of periarteritis nodosa subjected to autopsy at the Mallory Institute of Pathology were reviewed. Of these, 10 showed renal and 2 showed ureteral involvement. In view of the frequent renal involvement in periarteritis nodosa, and the finding in this patient of ureterograms showing a characteristic picture not found in other diseases, it is suggested that urological examination of patients having bizarre abdominal pain should be a routine preoperative procedure. 6 references. 4 figures. *R. S. Fisher.*

THE BILHARZIAL URETER: SOME OBSERVATIONS ON THE SURGICAL PATHOLOGY AND SURGICAL TREATMENT.

Naguib Makar, Kasr El Ainy Hospital, Foad 1st University, Cairo. British J. Surg. 36:148-55, October 1948.

Bilharzia worms reach the submucous layers of the ureters. Body defenders collect around the ova to form a bilharzial unit. In the hyperplastic unit, the bilharzons in the ureter produce nodules and papilloma-like bodies. In the hypoplastic unit, there is fibrosis and calcification in the bilharzial ova; the mucous membrane covering such ova undergoes marked atrophic changes. Bilharzial ulcers are not so common in the ureter as they are in the bilharzial bladder. Secondary infection is a frequent complication. The common result is a dense fibrosis involving all or most layers of the ureter. The disease may be unilateral or bilateral. The lesions may be seen on the intravesical portion of the ureter or in that length of canal which lies between the bladder wall and level of the ischial spine; this segment is dilated and this finding is of diagnostic value. In some cases the whole ureter is involved in the disease. The ultimate result, whatever the site, is gradual dilatation of the tube proximal to the lesion. The ureteric muscle undergoes hypertrophy and then atrophic dilatation until the whole tube is enlarged and tortuous. Distention of the kidney pelvis and calyces follows.

Specific antibilharzial treatment should precede surgery. Strictures limited to the terminal inch of the ureter may be dilated by stiff ureteric bougies introduced through a catheterizing cystoscope. Dilatation of the stenosed region above the bladder is done after a ureterostomy performed just proximal to the stricture, which is then dilated by curved Hegar's dilators in a manner similar to that used for dilating the cervix uteri. Where stenosis is complicated by other intravesical bilharzial lesions, the bladder is opened after securing the stenosed ureter above it. Excision of the stricture, followed by end-to-end anastomosis, is applicable to lesions in the upper pelvic and lumbar regions. Where none of the procedures described can be done, there is indicated implantation of the ureter into the bladder, after resecting its stenosed segment. Bilharzial papillomata lying at ureteric orifices, or a little more proximally, can be fulgurated by a cystoscopic diathermy electrode; at higher levels there excision is done after ureterostomy; the longitudinal incision in the ureter is stitched up transversely or obliquely to guard against stenosis. If the surgical procedure described cannot be done, nephrectomy is justifiable.

Operative intervention is preferable, especially in severe lesions. Excision of the affected parts, followed by ureteric anastomosis, gives good results. Implantation is well worthy of trial. 24 figures.

TRANSURETEROPYELOSTOMY AND TRANSURETERO-URETEROSTOMY. THE INDICATIONS AND OPERATIVE TECHNIQUE.

Thomas D. Moore, John Gaston Hospital, College of Medicine, University of Tennessee and Moore Clinic, Memphis, Tenn. J. Urol. 60:859-73, December 1948.

The historic background of transuretero-ureterostomy is reviewed, including experimental work demonstrating the anatomic and physiologic success of the operation on dogs and on the cadaver. A review of the literature failed to reveal any reference to transplantation of a ureter to the opposite renal pelvis either experimentally on animals or on the human.

In a total of 8 collected cases in which a ureter has been anastomosed to the opposite one, it is worthy of note that there have been uniformly satisfactory end results and no mortality. The indications for such conservative procedures are: (1) vesical regurgitation conducive to pain or to attacks of acute pyelonephritis; (2) surgical ureteral trauma of certain types; (3) sloughing of the ureter subsequent to its extensive mobilization and interference with the blood supply; (4) pathologic conditions, either neoplastic or inflammatory, extensively involving the lower ureter; (5) primary ureteral tumors, either benign or of a low degree of malignancy, situated in the lower third of the viscus; and (6) intractable cicatricial obstructions located in the lower half of the ureter.

The author's experience with experimental work on dogs and on the cadaver, demonstrating the anatomic success of transplanting a ureter to the opposite renal pelvis, is related. A case is presented in which transuretero-ureterostomy was performed for bilateral surgically injured ureters with a satisfactory end result. Another case is reported in which a transureteropyelostomy was carried out on a patient with bilateral renal ectopia because of unilateral regurgitation of infected vesical contents, with a gratifying end result. The physiologic success of a transureteropyelostomy at the normal renal level on the human is yet to be demonstrated. 4 references. 9 figures.

—*Author's abstract.*

SKIN-TUBED URETEROCUTANEOUS TRANSPLANTATION.

Geza Schinagel and George Sewell, Wayne University, College of Medicine, Detroit, Mich. J. Urol. 60:586-90, October 1948.

One-stage bilateral ureterocutaneous transplantation is reported with different methods for the skin pedicles to surround the protruding ureteral stump. A 10 cm. long skin incision is made close to McBurney's point, and the aponeurosis and external oblique are split in the direction of their fibers and retracted. The internal oblique and transverse muscles are split in their

fiber direction, and the peritoneum is separated from iliac fossa and lateral pelvic wall tissues until the external iliac artery is reached. The ureter is freed from its bed, not stripping it, and a double threaded silk suture is placed in the periureteral tissue about the distal ureter in the pelvis; the ureter is clamped and divided proximal to the clamp; the clamp is removed after the distal stump is phenol-alcoholized. A No. 12 catheter is inserted in the proximal stump and the ureter is brought out above the skin through the middle of the incision. It protrudes about 4-5 cm. above the skin after releasing the peritoneal traction. The divided muscles and aponeurosis are lightly approximated around the ureter.

The length and size of the projecting ureter are measured, and skin pedicle flaps are prepared to "tube" it. If the abdominal wall is loose, then bilaterally from the incision the skin is undermined in its subcutaneous layer. Enough mobility is allowed to map out, opposite one another, quadrangular skin pedicles which can cover the protruding ureter from both sides. These pedicles are approximated with interrupted silk sutures to produce a tube around the ureter. Steel wire suture is used on the base of the tube. The ureter is fixed at the upper part of the skin tube with the silk suture which had been placed through the periureteral tissues, and a few silk sutures strengthen the ureteral opening to the skin tube. If the ureter is longer than the tube, its orifice is incised so that its mucosa can be turned outside to suture it to the skin of the tube. On either side of the skin pedicles, triangular skin flaps are removed, producing two new incisions, and replacing the original skin incision.

If the patient is obese and the skin taut, the ureter is measured and skin pedicles are made, bilaterally to the incision with parallel incisions. The base of the pedicle reaches beyond the exit point of the protruding ureter. The skin pedicle can readily cover one side of the ureter. By approximating the bilateral skin pedicles with interrupted silk suture, a tube is produced around the ureter. The pedicle bases are reinforced with steel wire.

Another method to form the tube is by having a single, longitudinal skin pedicle wrap the ureter, corkscrew-like.

To have the ureter completely covered, the skin pedicle edges may slightly overlap each other under normal tension. The sutures on the pedicles should be applied longitudinally. After covering the tubed ureter with fine mesh gauze, the urethral catheter is fixed vertically with a wire frame. Sutures are removed about five days postoperatively. When the graft heals, the catheter is removed and a bag is fitted over the dermal tubes. 3 references. 3 figures.

THE ROLE OF URETERO-INTESTINAL ANASTOMOSIS IN GYNECOLOGY AND FEMALE UROLOGY.

Lawrence R. Wharton, Baltimore, Md. J. Urol. 61:36-42, January 1949.

Due to recent improvements and simplification in the surgical technic and the advent of effective chemotherapy, uretero-intestinal anastomosis has become a fairly safe procedure. Also, the operative mortality and the

final result depend upon the reason for which the procedure was done and the physical condition of the patient. These problems are discussed in the paper.

It is pointed out, however, that even under the most favorable conditions, the result of the operation is unexplainably unpredicable. Even the simplest case may be followed by anuria and uremia that may require pyelotomy for temporary relief, until the anastomosis functions normally.

The indications for the operation are discussed in the light of this knowledge, and its role suggested in exstrophy of the bladder; incurable vesicovaginal and urethrovaginal fistulas following childbirth, pelvic carcinoma and irradiation; and as a palliative measure in inoperable carcinoma of the blader and urethra.

Cases are cited to illustrate the indications and contraindications in each group of conditions. Also, the end results are discussed.

In general, the operation is clearly indicated and has afforded most appreciated relief in these patients, when properly used. Insufferable pain, urinary incontinence, and the resulting social isolation are avoided and patients are enabled to lead a fairly normal and comfortable life, depending upon their physical status.

The author also warns against the unwise use of this procedure in conditions that can be cured, but only after long and patient treatment. Such conditions are tuberculosis of the bladder, chronic interstitial cystitis, and fistulas that are operable. 8 references. 3 figures.—*Author's abstract.*

DIVERTICULUM OF THE URETER.

Morton M. Mayers, Ross-Loos Medical Group, Los Angeles, Calif. J. Urol. 61:344-50, February 1949.

Diverticulum of the ureter is sufficiently rare and of sufficient diagnostic interest to warrant additional case reports. There has been considerable confusion in the literature of the past due to the fact that conditions which were obviously urethroceles, segmental hydro-ureters, vesical diverticula, hydronephrosis and blindly-ending branches of bifid ureters, were reported as ureteral diverticula; in particular, blindly-ending branches of bifid ureters have been reported as such.

Culp, in a recently published article, after carefully reviewing the literature, tabulated 15 cases of both congenital and acquired diverticula, 10 of the former and 5 of the latter. He added 1 case of his own, and with one additional case in the literature, the totals are raised to 11 and 6 respectively. The author desires to report an eighteenth case of ureteral diverticulum, which is the twelfth case of congenital diverticulum to be reported.

The patient involved was a 39 year old woman, in whom the true condition was only recognized after some time. She was discovered to have had a diverticulum of the lower portion of the left ureter and in the course of treatment a stone was found to have developed in the diverticulum. Surgery for eradication of this diverticulum with the enclosed stone was accomplished on December 14, 1941. A six-year follow-up reveals the kidney

and ureter to approximate the normal, and the patient has been relieved of all symptoms related to this condition. 3 references. 1 table. 3 figures.—*Author's abstract.*

PRIMARY CARCINOMA OF THE URETER.

John Herman Long, Baltimore, Md. J. Urol. 61:23-28, January 1949.

The apparent increase in frequency of primary carcinoma of the ureter is probably due to more frequent recognition of the disease as a result of improvement in diagnostic equipment, and an increase in the number of well-trained urologists.

A review, and summary of the literature on the condition reveal the following facts: (1) twice as frequent in males as females; (2) over 50% of cases occur in sixth and seventh decades; (3) right ureter affected twice as frequently as left; the lower third of the ureter twice as frequently as the upper two thirds; (4) characteristic symptom triad, hematuria 70%, pain 64%, tumor 40%; (5) urine may be grossly bloody or clear, even microscopically; (6) cystoscopy may reveal: tumor projecting from ureteral orifice 25%, bulge in ureteral ridge, edema and congestion of ureteral orifice, blood coming from ureteral orifice after rectal or vaginal manipulation, obstruction on attempt to pass ureteral catheter, decrease in function on involved side; (7) roentgenographic studies may reveal hydronephrosis on affected side, goblet shaped filling defect at site of tumor, metastases in bones or chest; (8) treatment of choice is extraperitoneal nephro-ureterectomy with segmental resection of bladder; (9) 60% of the tumors are papillary, and 40% are solid; (10) metastases occurred in 34%, most frequently in retroperitoneal lymph nodes, liver, bones and lungs; (11) postoperative deaths 25%; no patient surviving more than 4 years postoperatively died of metastases; of 40 patients reported well, only 14 have been followed more than 4 years; (12) follow-up should include examination every 3 months the first year, every 6 months the second, third, and fourth years, and yearly thereafter.

One case is reported of a 61 year old patient whose only complaint was painless, gross hematuria of 24 hour's duration. Preoperative pyeloureterogram showed a typical filling defect in the left ureter, and a left nephro-ureterectomy with segmental resection of the bladder was done. The patient has survived for more than 7 years without evidence of recurrence or metastases. Photographs of preoperative x-rays, gross and microscopic pathologic specimens are presented. 15 references. 4 figures.—*Author's abstract.*

CARCINOMA OF THE URETER: REPORT OF THREE CASES.

W. H. Brooks, Jacksonville, Fla. J. Urol. 61:29-35, January 1949.

In Case 1, a 48 year old man suffered intermittent attacks of colicky pain in the right flank radiating downward toward the urinary bladder.

A diagnosis of right ureteral calculus was made.

On cystoscopy there was no urine from the right ureter and none was aspirated from the ureteral catheter because of an obstruction. Bilateral pyelograms showed a small stone in the lower right ureter. Skiodan solution extravasated into the periureteral tissues. A diagnosis was made of impacted calculus in, and perforation of, the lower right ureter. At operation the ureter was dilated about 3 times and there was dilation and inflammation of periureteral tissues. There was a tear in the ureter 2 inches above the ureterovesical junction. Ureterocutaneous anastomosis was done. The patient elected nephrectomy. Twelve days later nephro-ureterectomy was done in 1 stage and papillary carcinoma of the upper ureter was discovered on pathological examination. The diagnosis was papillary carcinoma of the ureter, chronic and subacute pyelonephritis, suppurative pyelitis and nephrosclerosis. The patient recovered uneventfully.

Case 2, a 59 year old man, complained of chills and fever. He was given 300,000 penicillin units daily with sulfa drugs for 6 days. Five weeks previously he had undergone repair of bilateral inguinal hernia, with catheterization the first night postoperatively. Five days after hospitalization the temperature returned to normal with symptomatic treatment. Retrograde pyelograms showed a filling defect in the left ureter about 2 cm. long and 2 inches below the ureteropelvic junction with moderate dilatation of the ureter and renal pelvis above it. A diagnosis of tumor of the left ureter was made. Nephrectomy and partial ureterectomy were done. An abscess below the ureteropelvic junction with necrotic ureteral wall was present. At the lower margin of the abscess cavity a new growth apparently arose from the ureteral mucosa. It had extensively invaded the ureteral wall. The pathological diagnosis was scirrhous carcinoma. Treatment was successful with postoperative high voltage roentgen radiation.

In Case 3, a 51 year old man had painless hematuria with occasional pain in the left flank and left lower quadrant and intermittent pain in the lower portion of the back. There was tenderness to jar percussion over the left renal area. The urine was grossly bloody. On cystoscopy, pink urine dribbled from the left ureter. Grossly bloody urine drained from the left catheter. Bilateral retrograde pyelo-ureterograms showed duplication of the renal pelvis and upper ureter on the right side. On the left side there was hydronephrosis. After 4 days cystoscopy showed grossly clear urine in the bladder. A left ureterogram showed a round filling defect in the left ureter 2 cm. above the brim of the bony pelvis. Five days later there were signs of infection of the upper left urinary tract; these signs responded to sulfadiazine. A diagnosis of primary tumor of the lower left ureter was made.

Nephro-ureterectomy was done. The ureter 2 inches above the urinary bladder was dilated and a tumor mass was palpated at this point. The ureter was entirely removed with a small cuff of the bladder wall. The pathological report was papillary carcinoma of the ureter with squamous metaplasia, and early sclerotic changes in the kidney and kidney abscess. The postoperative course was uneventful. 7 figures.

CLINICAL INTERPRETATION OF PYELO-URETERAL DILATATION OF PREGNANCY BASED UPON EXPERIMENTAL STUDIES.

Ralph H. Jenkins and G. van Wagenen, Yale University School of Medicine, New Haven, Conn. J. Urol. 61:217-21, February 1949.

Pyelo-ureteral dilatation, which occurs in about 95% of first pregnancies, is considered to be the predisposing cause of pyelitis. While the early explanation stressed the increased size and weight of the uterus, the writers have shown, experimentally, that distention of the urinary tract can occur in the absence of the fetus and they have associated it with the endocrine function of the placenta. Just as in the human, 'hydroureter of pregnancy' was demonstrated in the Rhesus monkey, a most favorable animal for studies, in physiology of reproduction because of the 28 day menstrual cycle and prolonged gestation. If the fetus is removed by hysterotomy early in gestation the pyelo-ureteral dilatation will arise later, and if the dilatation is present at the time of operation, it will persist as long as the placenta is functioning, that is, until the placenta is spontaneously delivered at term. In three instances of death of the fetus with demonstrated ureteral enlargement the placenta remained hormonally active, paralleling the earlier experiments.

Successive pregnancies were studied and it was found that the greatest dilatation occurred in the first pregnancy, decreasing in each succeeding pregnancy, which indicated a greater susceptibility to infection in the initial gestation.

Clinically this work indicates that most urinary tract complications of pregnancy will occur in the first pregnancy, and that previously unrecognized congenital anomalies and other pathologic lesions may be aggravated by the urinary tract stasis of pregnancy. They recommend the study of the upper urinary tract before pregnancy. If this is not possible, intravenous urograms should be done early in the first pregnancy, thus trouble is anticipated before it arises and pregnancy made safer by appropriate therapeutic measures. If there is no pathology present, grossly distended ureters in the first pregnancy may be treated conservatively, with the knowledge that dilatation will lessen in succeeding pregnancies, thereby lessening the possibility of pyelitis in later pregnancies. 7 references.—*Author's abstract.*

11. Bladder and Urachus

VESICOCOLIC FISTULA COMPLICATING DIVERTICULITIS: CASE REPORTS.

Fedor L. Senger, Brooklyn, N. Y. J. Urol. 61:437-42, February 1949.

The etiology of vesico-intestinal fistula is divided into 4 general classes: inflammatory, traumatic, neoplastic and congenital. The fistula occurs more frequently in men than in women in the ratio of 3 to 1. The fistula opening is most often on the left of the fundus and on the posterior wall. The diverticulum generally originates in the sigmoid colon.

There is first an acute inflammatory reaction from a filling of the diverticulum with feces and bacteria. The diverticulum orifice becomes occluded because of edema and this is followed by peridiverticulitis and dense adhesions between bladder and bowel. The inflammation subsides or proceeds to suppuration, rupture and development of the fistula.

The presenting complaint is usually pneumaturia and then fecaluria. There are symptoms of acute cystitis which gradually subside and later recur. There may be lower abdominal pain, fever, and other symptoms of diverticulitis, depending upon the location and extent. Pneumaturia is not pathognomonic of a fistula.

A minute colic fistula allowing passage of gas but not feces may escape immediate detection. A complete urologic examination is necessary. The location of the acute and inflammatory reaction characteristically occurs on the posterior wall of the bladder or fundus, unlike usual forms of cystitis which are confined to the trigone or are generalized. Cystograms may be diagnostic but often fail to demonstrate the fistula. Barium enemas also fail in this regard. The small fistula is more successfully demonstrated by combined use of a bladder aerogram and a barium enema. This is done by injecting 8-10 ounces of air into the bladder following a barium enema. After partial barium evacuation, the patient strains down as the postevacuation film is taken.

Proctoscopy alone is a poor method of visualization. The combined use of a colored solution, injecting it into the bladder, and then direct observation of its exit into the sigmoid, is sometimes valuable.

Treatment is essentially surgical, involving a colostomy followed by a long period to allow the inflammation to subside. In cases of nonhealing, the fistulous tract is subsequently explored, the diseased bowel is resected, and the fistula is repaired. The desirability of a temporary suprapubic cystotomy or an indwelling catheter is stressed, following the second stage. A third operation is the closure of the colostomy. Six illustrative case histories are presented. 6 references.

INTRAPERITONEAL RUPTURE OF THE URINARY BLADDER COMPLICATING FRACTURE OF THE PELVIS. TECHNICS OF REPAIR.

Rigdon K. Ratliff and Alvin S. Isaacson, St. Joseph's Mercy Hospital, Ann Arbor, Mich. Arch. Surg. 57:681-85, November 1948.

The successful treatment of these rare and often fatal lesions of the bladder consists, first, in the treatment of shock; second, in the confirmation of the lesion by cystogram, and third, in early operation. The technic described has facilitated the operative procedure. The principal variation in technic is the conversion of the traumatic rent into a surgical incision extending from the depth of the rent in the bladder and peritoneal reflection to the anterior abdominal wall. Following exploration, the structures are easily closed, suturing first the peritoneum, then the bladder, working anteriorly from the depth of the wound. 2 references.—*Author's abstract.*

THE VESICAL NECK SYNDROME IN WOMEN OF MIDDLE AGE.

Magnus Seng, W. John Cochrane, and F. Gordon Mack, Montreal, Que. Canad. M.A.J. 60:39-44, January 1949.

A series of 225 females showing the so called "vesical neck syndrome", of frequency of urination, urgency, painful voiding, terminal distress, terminal blood and tenesmus is presented. The symptoms appeared in 63% of the patients after forty years of age, the preclimacteric, climacteric and postclimacteric age periods. In 19.1% it occurred during the period of child bearing; 84.5% were married and 62.7% had one or more pregnancies. An associated upper tract condition was found in 57 patients.

The principal symptoms in order of frequency are: frequency of urination (98.6%); painful urination (50.9%); urgency of urination (27.5%); terminal distress (24.0%). Chills and fever were uncommon. Over 60% complained of symptoms from one day to eighteen months; 40% had symptoms from two to seven years or more. Pyuria was found in 173 cases.

Lesions or abnormalities were found in the following order of frequency: (1) the urethra, 37.3%; (2) the vesical outlet, 35.8%; (3) the bladder mucosa and wall, 13.8%; and (4) the pelvic outlet, 13.1%. The commonest lesion was a contracted urethra, forming 28.6% of all lesions. Trigonal changes formed 24.6% of all lesions and were varied and diffuse. The vesical neck showed 17% of the frankly inflammatory lesions. Bladder changes consisted mainly of inflammatory reactions, cystitis either acute, subacute or chronic. Granular change of the mucosa of the vesical outlet was common. Pseudomembrane of the trigone made up one fifth of the lesions of the trigone. Follicles and cysts constituted one fourth of the observed lesions of the vesical outlet. Hyperplastic mucosal fronds formed only 6.1% of the lesions found in the vesical outlet.

The probable etiological factors include trauma, infection, vitamin deficiency, and endocrine imbalance. In regard to treatment, only symptomatic and palliative treatment should be done for the acute case with pyuria until the acuteness subsides. There should be alkalinization of the urine. Urinary antiseptics are then used. For the acute case with clear urine and no pyuria, citrocarbonate or pyridium should be tried in the acute stage. In stricture, dilatation is the most important single procedure. Caruncle of the urethra is dealt with by excision, fulguration or electrocoagulation. Dilation of the urethra must be carried out as well. Granular conditions, follicles and cysts of the vesical outlet are best treated by dilatation of the urethra. In mild cases of contracted vesical neck, dilatation may suffice. 7 references, 4 tables.

URETHROSTOMY DRAINAGE OF THE BLADDER.

John G. Sandrey. Proc. Roy. Soc. Med. 41:777-80, November 1948.

Suprapubic cystotomy is unsatisfactory for the relief of bladder obstructions because it is mechanically unsound and is accompanied by a high

incidence of fatal urinary infections. Indiscriminate use of the indwelling catheter for more than two or three days was unsatisfactory because less than 10% of cases could tolerate a size 22 Ch. catheter or larger for more than a week, and a smaller size is unsuitable for drainage. Urethrostomy is not ideal but is simple, safer, and mechanically effective. It is especially valuable as an alternative to immediate prostatectomy, gives an increased safety margin on complete closure after operations on the bladder or prostate, and enables drainage to be indefinitely maintained. This method has been successfully used by the author in 379 cases during the past two years.

The closed method of Barney is ordinarily used. In this, a rubber catheter is passed along the urethra for its full length, and the lower end clamped with a curved artery forceps which is then advanced until its tip reaches the bulbous urethra. The handle is rotated 180 degrees and the point in the perineum cut down upon. The end of the catheter is disengaged and the instrument withdrawn through the incision to the proper length for bladder drainage. The open method is used in patients who have a stenosed external meatus or congenitally small urethra. In this, a perineal incision is made into the urethra on a small curved metal bougie. The edges of the urethral mucosa must be carefully identified and grasped with fine tissue forceps before the catheter is passed to prevent urethral invagination. The closed method can be easily done in bed under local anesthesia but the open method requires wider dissection and should not be done under local anesthesia. The best position for the urethrostomy opening is in the scrotal raphe about one inch in front of the perineo-scrotal angle. If placed farther back, it is poorly located for nursing, anal contamination is more likely, kinking of the tube is hard to avoid, and spontaneous closure of the fistula after catheter removal is slower. The catheter tends to kink excessively if the opening is too far forward and replacement is difficult. The best method found for catheter fixation is making numerous half-hitches with a nonabsorbable suture around the catheter and stitching it to the skin in front and behind. A whistle-tip resectoscope catheter with at least 3 lateral eyes has been found best for postoperative drainage after prostatectomy and partial cystectomy. The best position for the patient seems to be with the tube draining over the thigh and the scrotum supported on an elastoplast bridge. 18 references. 1 table.

INTERSTITIAL CYSTITIS. REPORT OF 223 CASES (204 WOMEN AND 19 MEN).

John R. Hand, Portland, Ore. J. Urol. 61:291-310, February 1949.

An analysis was made of 223 cases of interstitial cystitis (204 women and 19 men). Three arbitrary grades were set up in accordance with the cystoscopic findings in these cases, and each case was evaluated on this basis.

Grade 1 represented minimal bladder involvement. On distention there were small, discrete, submucosal hemorrhages which varied in form. Near

the trigone, for example, there were dotlike bleeding points. On the walls the bleeding areas were often single or parallel linear streaks. Occurring chiefly in the trigone and base, however, the lesions caused little or no restriction to bladder capacity.

Grade 2 represented a more advanced stage of the disease. The lesions were larger and they gave the impression of a localized edema of the bladder walls. On distention, bleeding points could be seen in the thinned out mucosa overlying the edematous areas. The most frequent sites of involvement were the walls. Bladder capacity was considerably diminished.

Grade 3 represented the most advanced stage of the disease. In the greatest number of cases the lesions were recorded as being "diffuse." The mucosal surface was pale and often showed linear scars of old lesions. While there was bleeding on distention, the dominant finding was a zigzag fissuring which suggested a split along the lines of the underlying vascular network and muscle bundles. Bladder capacity was greatly diminished, being 150 cc. or less.

According to these criteria, 138 women and 15 men had minimal, or grade 1, lesions; 37 women and 4 men had active, or grade 2, lesions; and 29 women had far advanced, or grade 3, lesions.

There was no difference in the character of the disease in the two sexes, except that in none of the men did the lesions reach the far advanced stage of grade 3. Most of the minimal lesions were found in the trigone-base area, whereas the greatest number of advanced lesions involved either the whole of the bladder or were confined to the dome.

Nineteen patients had no night frequency at the time of the diagnostic cystoscopies. This symptom developed later.

One patient with interstitial cystitis had a co-existing carcinoma of the bladder. Ten other cases are cited from the literature.

A study was made of various concurrent abnormalities. There was a higher incidence of allergies, gallbladder disease, cystoceles, pelvic operations, and some types of foci among the patients with interstitial cystitis than among those in the group selected for comparative study.

Treatment of the patients with interstitial cystitis was both general and local. The largest percentage of improvement occurred in the minimal lesion group. Because of the high incidence of castrates among the women with interstitial cystitis (36 as against 14 in the control group), the need for adequate management of the endocrine factor was stressed. Two women had ureteral transplantations for relief of the intractable pain of interstitial cystitis. One of these women also had a cystectomy at the time of the ureteral transplantation.

Microsections of the extirpated bladder showed capillary dilatation together with thickening of the arterioles, dilation of the venous structures, and compression of the lymph channels. The most significant finding, however, was nerve involvement, as evidenced by edema and extensive leukocytic infiltration about and within the nerve sheaths.

A review was made of the etiologic relationship of infection, circulatory

impairment, the lymphatics, the endocrine system, the nervous system, the collagen diseases, and allergy.

From the microscopic evidence of nerve tissue involvement in the extirpated bladder as well as some of the clinical findings in the present study, it would seem that a neurogenic factor is responsible for the initiation and then the continuation of interstitial cystitis. 51 references. 6 tables. 5 figures.—*Author's abstract.*

ENURESIS IN CHILDREN.

Harry Bakwin, New York University, College of Medicine, New York, N. Y. J. Pediat. 34:249-62, February 1949.

Enuresis is one of the most frequent afflictions of children. In the dispensary population at Bellevue about one-fourth of the children between 4 and 12 years of age, inclusive, wet the bed. In about 40% of the cases there is associated day-wetting.

Three features are characteristic of the patient with enuresis: a hereditary background, urgency, and persistence of a sensitive bladder into adult life.

The author looks upon enuresis as a developmental abnormality in the urinary function analogous to the developmental abnormalities in the language functions (speech disturbances, specific reading disability). Like the language disorders, enuresis is hereditary, it appears early in life, it tends to improve, and residuals of the abnormality (excessive sensitivity to the stimuli which normally lead to urgency) persist throughout life.

The basic manifestation is considered to be urgency. Cystometric studies of the bladder function by McLellan and others show that the fault lies in the response of the bladder to distention. They found that, in a considerable proportion of patients with enuresis, the bladder reacts fairly normally to injected fluid until bladder capacity is reached. At this point the urge to urinate is immediate and imperative.

Psychic and training factors play important, but secondary, roles. Personality changes, as a result of the social implications of the habit, are common.

Treatment depends upon a due consideration of the total situation (parental attitudes, the reaction of the child to his symptom), suggestion, rewards, training and drugs. Belladonna, in increasing doses up to a therapeutic effect, helps a considerable number of patients. Methyl testosterone has also been found useful. 34 references.—*Author's abstract.*

VESICO-APPENDICEAL FISTULA.

Herman J. Meisel, Harold N. Kagan and Joseph M. Miller. J. Urol. 61:43-45, January 1949.

Vesico-appendiceal fistulas constitute about 4% of all cases of vesico-intestinal fistula. The patient may or may not give a history of a previous

attack of acute appendicitis. The symptoms are those of chronic or acute cystitis. The presence of feces in the urine and the occurrence of pneumaturia is strong evidence for a vesico-intestinal fistula. Occasionally urine may flow through the fistula into the bowel, resulting in a chronic diarrhea. Diagnosis is made by: (1) cystogram which may outline the abnormal tract and show dye in the colon; (2) roentgenographic examination of the colon which may show the tract passing into the bladder; (3) at cystoscopy, either an aperture or a small mass of granulation tissue may be present on the right side of the dome of the bladder. Occasionally a catheter can be passed through this and x-ray will show it appearing in the colon; (4) various dyes such as methylene blue may be instilled in the bladder and recovered from the colon. Others, such as barium or charcoal, may be administered orally and recovered in the urine. The treatment is simple and consists of appendectomy with closure or excision of the portion of the bladder involved in the fistula. Appropriate chemotherapy should be used. An illustrative case is presented in which there was also present a vesical calculus. The permanence of results of a simple operative procedure for vesico-appendiceal fistula amply reward every effort put into the diagnostic search. 3 references.—*Author's abstract.*

FISTULA BETWEEN THE RECTUM AND URINARY TRACT.

Norman Wyndham, Sydney, New South Wales. British J. Surg. 36:175-81, October 1948.

Fistula between rectum and urinary tract arises from 4 causes: injury, inflammation, new growth, or congenital abnormality.

In fistulas resulting from injury, one variety is fistula between rectum and ureter. This condition is rare. A second variety is rectovesical fistula which is not rare. In traumatic cases, half are the results of operations and one-third heal spontaneously. Suprapubic cystostomy with constant suction is essential in most cases, and the passage of feces must be controlled with diet and drugs which aim to secure constipation. The sphincter ani is dilated. A third variety is recto-urethral fistula. The treatment of rectovesical fistula applies to this lesion. Cure by operation is easier because of accessibility. The perineum is to be drained early, and there should be suprapubic drainage of the bladder and constant suction. The rectum is separated from the urethra and the wall of each repaired.

In inflammatory fistulas, the first stage is formation of an abcess which finally ruptures in a neighboring organ. The development is insidious; the first indication may be pneumaturia and passage of feces through the urethra. Pneumaturia is finally one of the most constant symptoms. The treatment varies with the causative pathological condition; surgical approach for excision of the tract varies with the position of the fistula.

Congenital fistulas are rare and are usually a complication of imperforate anus. The most frequent anterior opening of fistulas in the male is into the prostatic urethra. The fistula may enter any part of the membranous or penile urethra. Fistulas between rectum and urinary tract are not so

likely to occur in the female. Normal existence is possible in the presence of recto-urinary fistula if the anus is patent. In treatment, many fistulas close if the obstruction to the rectum is removed. No blind puncture of the rectum should ever be done, and open dissection should be successful. Colostomy is avoided except as a last resort. If the fistula does not close spontaneously, it must be dissected out. 22 references. 16 figures.

NORMAL AND ABNORMAL MICTURITION. A STUDY OF BLADDER BEHAVIOR BY MEANS OF THE FLUOROSCOPE.

S. Richard Muellner and Felix G. Fleischner. Beth Israel Hospital, Boston, Mass. J. Urol. 61:233-41, February 1949.

The present concept of the physiology of micturition in man rests in large measure on cystometry. This technic of investigation has led to the assumption that micturition is initiated by the action of the will on the detrusor, and that it is stopped by the wilful contraction of the external sphincter. The study of micturition under the fluoroscope reveals these concepts to be incorrect.

On the fluoroscopic screen deliberate micturition begins with a downward tug on the internal sphincter. This is brought about by the relaxation of the pubococcygeus (the anterior portion of the levator ani), aided by an increase in intra-abdominal pressure through the momentary fixation of the diaphragm at the end of an inspiration, and a brief contraction of the abdominal musculature. The internal sphincter is thus not pulled down, but rather pushed down. The quick descent of the internal sphincter causes reflex contraction of the detrusor. The detrusor contracts first at the base, and the contraction wave then quickly spreads to the sides and to the dome, so that during micturition the horizontal diameter of the bladder becomes smaller and the vertical diameter larger. To shut off the stream deliberately, the bladder is sharply raised by the contraction of the entire levator ani muscle. This flattens out the base of the bladder, and closes the internal sphincter. The detrusor gradually relaxes to its resting stage. Micturition is thus first shut off at the level of the internal sphincter.

These observations suggest that man has a distinct *"voluntary mechanism"* with which to start and to stop micturition at will. The voluntary mechanism is thus mediated through striated (voluntary) muscle, with a somatic (pudic) nerve supply, and is interposed between the will and the detrusor. The assumption that the will directly affects the smooth (involuntary) muscle of the detrusor is thus erroneous, nor could it be substantiated that the urinary stream is wilfully shut off by the mere contraction of the external sphincter.

The second part of the paper deals with the study of micturition in patients in whom the voluntary mechanism has been eliminated by disease. For this purpose, the behavior of the bladder in a case of cancer of the prostate, in a tabetic, in a paraplegic, in a patient with multiple sclerosis, and in a case of diabetic polyneuritis with hemiplegia, was studied. In the patient

with cancer of the prostate, the growth had fixed the gland in the pelvis, and had thus immobilized the bladder base, even though the bladder nerves were intact. The other patients had in common a flaccid paralysis of the muscles of the perineum which also effectively eliminated the voluntary mechanism. Despite the diversity of the underlying disease affecting micturition, these patients all showed "automatic micturition" which was carried out entirely by the detrusor when the bladder was distended to the point of "critical stretch". They could not deliberately initiate micturition nor stop the urinary stream at will. These findings suggest that a "cord bladder" is not the specific disturbance caused by a particular nerve lesion, which it was believed to be in the past.

The technic of bladder fluoroscopy is described. 5 figures. 12 references. —*Author's abstract.*

ALLERGY OF THE PELVIC URINARY TRACT IN THE FEMALE. A PRELIMINARY REPORT.

Lloyd Kindall and Thomas T. Nickels, Samuel Merritt Hospital, Oakland, Calif. J. Urol. 61:222-27, February 1949.

Allergy does occur in the urinary tract, is frequently unrecognized, and generally mistreated.

There are two longitudinal muscle layers in the ureter and between them a circular muscle layer. The circular layer is well developed in the upper ureter while the longitudinal muscles are small. Proceeding down the ureter, the circular layer becomes very small, while the longitudinal layers become larger. The ureter loses the circular fibers on entering the bladder wall, leaving the internal longitudinal layer, which gradually disappears in the bladder wall, while the outer longitudinal muscles extend through the trigone, under the internal sphincter of the bladder, and ends in the urethra.

The trigone muscle is a definite entity arising from the longitudinal muscle fibers of the ureters and superimposed on the muscles of the bladder wall. These fibers lie internal to the other muscular coats and spread out in fan-shaped arrangement decussating with those from the opposite side; some of them extend through the vesical orifice into the urethra.

On cystoscopic examination, it is this additional layer of muscle fibers which gives the trigone the appearance of being slightly elevated above the surrounding bladder wall. This arrangement may be partially responsible for the fact that increased ureteral irritability and activity are usually associated with irritability of the bladder, and result in the symptoms of urinary urgency and frequency. In the trigone, the submucosa is thin and the mucosa is closely attached to the muscularis, so that it is always smooth, even in the empty state.

The symptoms of dysuria and frequency are due to irritability of mucous membrane of the trigone, superimposed on the longitudinal muscles. Symptoms of pain are due to an allergic edema of the mucous membrane of the ureter or urethra, interfering with free drainage of urine into the bladder or through the urethra and causing spasm of the longitudinal layers. In

chronic cases there may be a narrowing of the urethra at any point, due to a stricture, or to a submucosal infiltration of mononuclear cells associated with hypertrophy of the underlying muscle layers.

It is possible for an individual to have allergic phenomena of the ureter, producing ureteral pain on the basis of hypertrophy of the mucous membrane, submucosa and underlying musculature, with additional allergic edema at the site, which in addition, could produce lower urinary tract symptoms with no demonstrable lesion of these portions of the urinary tract. Repeated episodes of allergy in the urinary tract and subsequent production of hypertrophied mucous membrane, submucosa, and underlying smooth muscle (as seen in the bronchi with an allergy state), with subsequent episodes producing edema and irritation of the areas, could account for cases of ureteral pain with no allergic phenomena taking place in the ureter.

Symptoms may vary from mild cystitis with dysuria, frequency, and nocturia 0 to 1 times, to severe type of urgency, frequency and sometimes terminal hematuria and frequent nocturia. Either of these conditions may be associated with the urethral or ureteral pain. Psychic factors are an important consideration in the predisposing, precipitation and maintaining of allergic diseases.

The urine sediment in mild cases contains only an occasional white cell, with no bacteria, as elicited by culture or stain. However, the occasional white cell, after proper centrifuging and treatment with Wright's stain, will show mononuclear leukocytes and frequent eosinophiles. In chronic cases, the urine sediment may show polymorphonuclear leukocytes and bacteria, as well as eosinophiles and mononuclear leukocytes. A differential stain of the Addis count is a valuable diagnostic procedure. Case reports are omitted.

In making the diagnosis, the following factors should be considered: 1) Appearance and biopsy findings of the urethral and bladder mucosa. Biopsies all show mononuclear cell infiltration and frequently many eosinophiles. These biopsy findings are similar to those in cystitis follicularis and bladder neck polyps.

2) Urine sediment in early cases may show an occasional white cell, and when treated with Wright's stain, are shown to be of mononuclear type. In early cases urine culture and stain are negative for bacteria. In chronic cases the urine sediment may contain many polymorphonuclear leukocytes as well as bacteria.

3) Blood smear will generally show an increase in the mononuclear leukocytes and a decrease in the polymorphonuclear leukocytes. The percentage of eosinophiles is frequently increased.

4) Skin testing is unsatisfactory as a positive diagnostic aid.

The plan of treatment is as follows: (1) Remove suspected agent responsible for the allergic attack; (2) dilatation of the urethra; (3) dilatation of the ureter and ureteral meatotomy when necessary; (4) In acute attacks administration of ephedrine and a barbiturate; (5) antibiotic and chemotherapy for complications; (6) restrict intake of fluids during attacks of pain. 12 references.—*Author's abstract.*

BLADDER NECK OBSTRUCTION: A REVIEW OF FIVE HUNDRED AND EIGHT CASES TREATED BY ENDOSCOPIC RESECTION.

Henry Mortensen, Melbourne, Australia. M. J. Australia. 2:714-18, Dec. 18, 1948.

There are various advantages to endoscopic resection. It has a low mortality: the overall mortality in this series was 3.6% but the rate for octogenarians was 2.75% and for the 75 year old and over age group only 1.6%. Early ambulation, getting practically all patients up on the third or fourth day and many on the first or second day, is most important for the older age group. The shortened hospital stay is economically important. The lack of pain and postoperative inconvenience minimizes shock and chest complications while giving patients a beneficial confidence. Analysis of the cases operated upon shows that greater risks can be taken with cardiovascular and pulmonary cases. A previous cystotomy had been performed in 51 cases of this series but the obstruction was removed by endoscopic resection and the suprapubic wound closed. Postoperative sepsis of the urinary tract has been urged as an objection to the operation but experience in these cases proved otherwise. Many leukocytes in the urine frequently occur during the first few weeks postoperatively, as well as some residual urine, but both usually clear up with epithelialization of the resected area and recovery from the bladder atony usually present with true obstruction. Postoperative epididymitis has been eliminated by the routine performance of vasectomy. The incidence of postoperative hemorrhage is now inconsequential. The author uses an inflatable bag with continuous irrigation for forty-eight hours but without traction on the bag.

Partial or complete urinary incontinence is not a special complication of resection, was present in varying degree in only 23 cases of this series, and in only 2 did it have any degree of permanence. Stricture is the only other troublesome complication and results from introduction of a large rigid instrument through a narrow urethra, plus continued pressure during the operation. Stricture sometimes occurs, however, when neither of these factors is present. It is prevented by care in the introduction of the instrument and of the hemostatic bags. A perineal urethrotomy should be performed and the instrument introduced through it if there is any difficulty in introducing a sound of similar caliber to the resectoscope. This is especially useful in obese patients. Secondary operation for persistent or recurrent obstructive symptoms was only necessary in 6 cases of this series and postoperative vesical calculus only occurred in 1 case.

Endoscopic resection is indicated for all cases in which a capsule has not been formed by the usual enlargement process, such as cases of fibrous bars, generalized bladder neck sclerosis, and carcinoma. Such cases should not be enucleated by any other approach as serious sepsis and postoperative scarring result from opening up dangerous tissue planes. Endoscopic resection is believed to offer a simple and effective cure to most prostatic patients, massive

size of the obstructing gland being the only contraindication to its use. 2 references. 9 figures.

UTEROVESICAL FISTULA.

Carl E. Burkland, Sacramento, Calif. J. Urol. 61:418-23, February 1949.

Uterovesical fistula, a recent rarity due to great improvement in obstetrical and surgical technic, is, like vesicovaginal fistula, the result of accidental, obstetrical, gynecological or urological injury, radium therapy or perforation from some inflammatory or neoplastic disease of the bladder, vagina or uterus. It is most frequently incurred during prolonged labor from compression of the bladder wall by the arrested presenting part.

The symptoms are leakage of urine from the vagina, frequency, dysuria and occasionally suprapubic distress and hematuria. The diagnosis is made by the history of incontinence, vaginal examination and cystoscopy. The appearance in the cervical os of a dye injected into the bladder is definite evidence of a communication between the two organs.

These fistulas tend to close by granulation and cicatrization but rarely completely. The treatment of choice is to close each end of the fistula separately. Many methods of repair have been advocated and either the vaginal or transperitoneal approach may be made, depending upon the height of the fistula in the uterus and the specific details of each case. For a successful operative result there should be adequate exposure, wide and free mobilization of the bladder, the free release of adhesions and scar tissue about the fistula, separate suture of uterus and bladder, and catheter drainage.

A case of uterovesical fistula in a 36 year old gravida 7, white woman following delivery by podalic version and extraction is reported. She complained of intermittent incontinence of urine following delivery and diagnosis was difficult because no urine or dye injected into the bladder was found to run from the cervix until the patient was placed in the knee-chest position. Cystography was of no help. Using the abdominal approach, the fistula was closed after hysterectomy was done. The bladder was drained suprapubically and the fistula healed well in the course of an uneventful convalescence. She has remained quite well for over two and a half years with no urinary distress. 18 references. 1 figure.—*Author's abstract.*

12. Urethra and Glands

PERSISTENT URETHRAL FISTULA FOLLOWING CIRCUMCISION. REPORT OF A CASE.

Spencer Johnson (Capt., M. C., U. S. N.). U. S. Nav. M. Bull. 49:120-22, Jan.—Feb. 1949.

Circumcision may be followed by complications that result in penile deformity and dysfunction unless proper surgical technic and adequate

postoperative care are employed. If necessary precautions in regard to asepsis are neglected, secondary infection may occur that may result in a disabling deformity or in a persistent urethral fistula. In the case reported, secondary infection after circumcision caused formation of ulcers along the line of suture, the largest ulcer being near the frenum, and finally controlled by the continuous application of 1:4,000 potassium permanganate solution dressings and penicillin given intramuscularly. Although the ulcers healed, the urethral fistula persisted. This was closed by the method of inversion of the fistula described by D. M. Davis in 1940. Suprapubic drainage was maintained for about six weeks, then urethral catheter drainage was employed for five days. The urethral fistula was well healed and the patient urinated normally. 2 references.

CIRCULAR PROLAPSE OF THE URETHRA.

Joseph H. Zeigerman and Robert A. Kimbrough, Jr., University of Pennsylvania, Philadelphia, Pa. Am. J. Obst. & Gynec. 56:950-54, November 1948.

Prolapse of the female urethra is a rare condition, and although the volume of literature on the subject has increased considerably in recent years, most of it has come from Continental clinics. During the last half century, only 22 cases of prolapse of the female urethra have been reported in the United States, 12 by gynecologists and 10 by urologists; almost half of this number (9 cases) were reported in 1945.

A list of the cases reported in the United States is presented. The literature in 1945 contained 311 collected cases. Since 1945, 8 additional cases were reported which, with the 2 herein described, make a total of 321 cases. The lesion occurs at any age and attended by tumor, pain, bleeding and urinary complaints. The incidence is about 47% in the age group of five days to 18 years; about 18% between 18 to 45 years, and in women over 45 years, about 35 %. The greatest incidence is between 8 and 12 years of age and 60 to 65 years. The youngest patient reported was a child 5 days old, and the oldest a woman 92 years old.

The symptoms and size vary with the extent of the circulatory disturbance. There may be necrosis and even gangrene of the prolapsed mass. The urethral orifice may be difficult to find as it often deviates to one side of the tumor mass, even necessitating in some cases a general anesthetic to disclose it. A biopsied specimen usually shows acute or chronic inflammation, engorgement, thrombosis, and, occasionally, hypertrophied submucous glands. The muscle layer is usually absent.

The full histories of 2 patients seen recently are briefly recorded.

Altogether 7 cases of urethral prolapse have been treated by us over a period of eight years with good results. An analysis of the individual cases is presented.

The onset, as observed in the majority of cases herein reported, points to a pre-existing lesion of the urethra with minimal symptoms for several years,

followed by direct or indirect trauma, which produced the acute symptoms.

Direct trauma was the precipitating cause in two 9 year old girls, an abnormal increase in intra-abdominal pressure due to persistent cough, chronic constipation, and diarrhea in 3 other patients, and subacute cystitis of long standing in the sixth case.

These patients were treated by excision of the prolapsed mucosa and by suturing the cut edges.

The technic of resection used in the last 2 cases has greatly simplified this operation. The suture ligatures which were placed at 3, 6, 9 and 12 o'clock on the face of the prolapse at the mucocutaneous junction served as a guide in the subsequent resection, preventing the retraction of the mucosa and diminishing the loss of blood.

In our experience with this condition, it was found that simple excision of the prolapsed mucosa has given excellent results; in one of these cases was there any recurrence. 16 references, 3 tables, 2 figures.—*Author's abstract.*

PRIMARY EPITHELIOMA OF THE MALE URETHRA.

C. W. R. Price, Perth, Australia. M. J. Australia. 2:691-2, Dec. 11, 1948.

Review of the literature shows that only about 150 cases of this disease have been reported. The mortality rate of cases having the tumor in the posterior urethra, including the bulbar, was 75% but only 25% of those occurred in the anterior urethra. It is stated that traumatic stricture is a common cause, the growth usually developing proximal to a stricture and spreading along the urethral mucosa and outwards into the corpus spongiosum. External fistulas are common. The most significant sign is an increasing induration at the site of stricture. It may be mistakenly incised for periurethral abscess. The growth may be seen by external urethroscopy but the diagnosis is frequently missed until late in the disease. Partial or complete amputation of the penis according to location of the growth offers the best chance of cure. It is believed that the inguinal glands should always be excised in addition but that castration is unnecessary.

An illustrative case is reported in a 75 year old man who had had increasing difficulty in micturition for some months. He had vague recollections of a perineal injury many years previously. Examination showed a resilient stricture at the penoscrotal junction. Cystoscopy was negative and urethroscopy was not performed. Malignancy was not diagnosed for seven months, treatment consisting of urethral dilatation and temporary cystotomy for acute retention. A permanent cystotomy was then done and a small piece of tissue discharged from the urethra into the bladder was found to be highly malignant. A radical penile amputation was performed but neither groin dissection nor castration done. The wound healed by first intention and the suprapubic sinus closed spontaneously. He was reported as very well six months later but was not seen afterward. 6 references, 2 figures.

RETROPERITONEAL CREPITANT CELLULITIS FOLLOWING URETHRAL INSTRUMENTATION. REPORT OF A CASE OF THE CLOSTRIDIAL TYPE.

A. Fred Turner, Jr., Louis M. Orr and J. C. Hayward, Orlando, Fla. J. Urol. 61:432-36, February 1949.

A case is reported in which a white man, aged 42, died of severe toxemia, rapidly mounting fever, peripheral circulatory collapse, diarrhea and vomiting, 55 hours after bougies were passed to maintain dilatation of the urethra achieved by internal urethrotomy 51 days earlier. Two other similar office dilatations carried out following urethrotomy had been uneventful. The onset of the terminal illness, with fever and malaise, occurred ten hours after the last dilatation. The temperature rose rapidly and progressively to 108 degrees and the blood urea nitrogen rose to 85 mg. per cent before death. Except for the first twelve hours in the hospital, the radial pulse was imperceptible and the extremities were cold. Blood and mucus were present both in the vomitus and in the diarrheal stools. Wangensteen suction aspirated enormous volumes of gas from the stomach, but the abdomen was not distended.

Necropsy four hours after death revealed crepitus due to emphysema in the walls of the stomach and colon and hemorrhagic areas in the mucosa. Numerous tiny gas-filled vesicles studded the muscles lining the pelvis and stripped up the pelvic peritoneum. One group of these vesicles with an attached piece of muscle tissue was cultured and B. welchii reported. Careful inspection of the urethra failed to reveal any evidence of injury produced by the passage of the bougies.

The term "crepitant cellulitis" was chosen to describe this case rather than the more commonly used term, "gas gangrene," because it is more descriptive of the actual pathological changes found, since gangrene did not exist, perhaps because the rapidly fatal course did not permit time for the progression to this point.

This case closely simulates the classical description given by Nason and Starr. Gas bacillus anti-toxin might have been of some value in combating the overwhelming toxemia. The peculiar characteristic of clostridial organisms to remain dormant in tissue for long periods of time and then to be activated by various unknown stimuli is discussed. 8 references. 2 figures.—*Author's abstract.*

MANAGEMENT AND MORTALITY OF PERIURETHRAL PHLEGMONS.

Joseph G. Rickert, Bellevue Hospital, New York, N. Y. J. Urol. 61:424-29, February 1949.

Periurethral phlegmon is properly defined as a septic infiltration following urethral infection and obstruction resulting in urinary extravasation. Urethral strictures of many years' duration are the main etiological factors in this disease. A large percentage of these strictures may be of large caliber.

External urethrotomy and drainage is the operation of choice for the following reasons: (1) The urinary obstruction incident to the stricture is relieved and the fundamental cause of the infection is thereby corrected; (2) The infected periurethral tissue is provided with drainage; (3) The dependent position of the drainage favors complete emptying of the bladder and (4) It has been shown that Colles' fascia guides 90% of the infections. As the extension is usually to the abdomen, due to the fact, anatomically, that Colles' fascia is continuous with Scarpa's layer, the infection then is superficial, really subcutaneous. A suprapubic cystotomy performed through this infected tissue would introduce the virulent organisms into the deeper, uninfected tissue under the rectus sheath.

Prompt radical incision and drainage, with diversion of the urinary stream, is essential because the phlegmon always begins as a periurethral abscess and the mortality in 194 cases of periurethral abscess was 0% as compared to a 32% mortality in 178 cases of periurethral phlegmons. Failure to operate on a periurethral abscess immediately may result in a periurethral phlegmon the next day.

To evaluate the effects of the sulfonamides and penicillin on the mortality of the disease, a total of 372 cases from Bellevue Hospital were used. Half of these cases were treated from 1932 to 1938 before sulfonamides and penicillin were used, and the other half were treated from 1940 to 1946 when sulfonamides and penicillin were used. These figures showed that the mortality was reduced from 38% to 20% in the later series. This is a significant reduction in mortality, as large series of periurethral phlegmons published previous to 1938, and without the use of sulfonamides and penicillin, showed a mortality from 38% to 56%. The conclusion reached was that prompt radical incision and drainage, with diversion of the urinary stream by means of an external urethrotomy combined with the use of sulfonamines and penicillin, reduced the mortality of periurethral phlegmons by over 20%. 8 references, 1 tables.—*Author's abstract.*

THE FEMALE URETHRA. A CLINICO-PATHOLOGICAL STUDY.

Norborne B. Powell and Elizabeth B. Powell, Baylor University, Houston, Tex. J. Urol. 61:557-70, March 1949.

The problems relating to the female urethra have fascinated urologists, embryologists, and pathologists for many years. The preponderance of opinion is to the effect that there are periurethral glands in the posterior urethra which often become infected and occasionally undergo hyperplasia. A contrary view is held by Cabot, MacKenzie et al., and Thompson. Many writers have side-stepped the issue of the existence of true mucus-secreting acini in the posterior urethra and whether or not these should be designated "female prostrate." However, these men do recognize that the posterior urethra is a frequent source of urological complaint and they have contributed much to its clinical study. During 6 years of urological practice, a total of 603

nonconsecutive private patients have been followed sufficiently to compile the data for this paper.

The urethral syndrome is protean in its manifestations and frequently flares up following pregnancy, a surgical procedure, or an illness which confines the patient to bed. Bladder discomfort affected over 95% of the cases. The onset was sudden or gradual over a period of weeks, months, or even years. In a high percentage of cases there was a history of one or more previous episodes of bladder discomfort.

Referred pain usually was a dull, indefinite suprapubic ache or pain in one or both groins, thighs, hips, loins, lumbosacral or sacroilliac areas. Occasionally it was severe, and alternated with cutting pains that simulated ureteral colic. Unilateral referred pain can be mistaken for intestinal or appendiceal, ureteral or renal, ovarian, tubal or uterine involvement. In this series 179 patients had backache, and approximately 80% were diagnosed and relieved by the passage of urethral sounds. Calibration of the urethra is essential in the differential diagnosis when pelvic pain or backache is present.

Frequency of urination was complained of by over 36% of 603 patients. A burning, aching pain following urination accounted for 1 out of 3 patients' symptoms. Urgency of urination affected 28% of the cases studied and occasionally was severe enough to produce incontinence, so this is in contradistinction to effort incontinence. Varying degrees of nocturia were noted in 1 out of 4 of the 603 patients. Only 9% of the women complained of a feeling of residual urine after voiding. Partial incontinence was obvious in 46 or 7.6% of the cases. In 8.6% of this series gross hematuria, usually painful, was the chief complaint. Only lower urinary tract hematuria is included. Thirty-five cases (5.9%) had complete urinary retention, either acute or chronic. The oldest was a 56 year old woman who had catheterized herself intermittently for 20 years. Chills with temperature (102-105F.) was the initial finding in 42 cases (7%). Complete urological investigation revealed only urethral and/or bladder neck disease in these women or female children as the etiological factor. Urethral sounding, antibiotics, and chemotherapy relieved the chills and fever.

Low grade fever in 24 women (4%) previously had been diagnosed as fever of an unknown origin. Straining to urinate, or increased difficulty in voiding was found in only 33 patients (5.4%). Dyspareunia was an infrequently recorded symptom. Only 14 women (2.3%) confessed to painful coitus, though varying degrees of aversion, lack of orgasm, or real pain must be far more frequent than these data would indicate. With a sound in the urethra the pain produced by vaginal palpation of the instrument often will duplicate the vague indefinite discomfort that most women (and practically all gynecologists) associate with uterine malpositions or ovarian diseases. It is possible to relieve or cure these cases of dyspareunia rather easily by treating the urethra.

Panendoscopy was done in all cases and there was pathological narrowing of the urethra in a total of 263, or better than 43%, of these cases. Periurethritis was rather marked in 130 instances, and was found in almost every case of urethral or meatal stricture. Granulations of the urethra were found

in 145 women, and 215 had polyps. Enfolds were thought to be the cause of obstructing symptoms in 53 instances. In 10 cases these urethral bulgings were definite enough clinically to diagnose the case as a "Folsom female prostate."

In 9 cases there were gross trabeculations with cellule formation, and in 2 cases cystograms demonstrated well developed bladder diverticula. In 42 cases a well formed median bar, or bladder neck contracture, was seen cystoscopically. Nine of these were in female infants or children and were considered to be congenital. Residual urine was found in 26 cases. Almost invariably when the residual urine amounted to more than three ounces, the patients had developed frequency, nocturia, and/or infection.

In all of the 603 patients, office treatment was tried. Occasionally endoscopic application of 5-20% silver nitrate was helpful. Endoscopy was repeated in every instance before the patient was discharged. Those refractory to office treatment were re-examined with special attention to the bladder neck and posterior urethra. If polyps were found and were not too numerous or too large, a gentle superficial fulguration of a small segment of urethra with a point-tipped electrode through the McCarthy panendoscope was done at 10-14 day intervals. Sixty-one patients were fulgurated one or more times in the office.

Those cases which were resistant to office treatment and fulgurations, and persisted in carrying a residual of over 3 ounces, were resected transurethrally. This procedure was carried out in the office under local anethesia on 14 women who had contracted bladder necks. Eleven were cured promptly. Three of these 14 cases did not respond, and were hospitalized for operation. In this series there were 62 hospital patients who had 65 operations. Thirteen of these were fulgurations and 49 were resections of the bladder neck and posterior urethra under spinal or pentothal anesthesia.

Tissue from 47 resected cases was available for study.

Grossly the weight of the specimens varied from 0.5 Gm. to 3.5 Gm.

Most of the urethras were lined by a squamous rather than a transitional type of epithelium, and erosions or superficial ulcerations occurred in 81% of the cases. The inflammatory cells were mostly lymphocytes and plasma cells with a scattering of eosinophiles and neutrophiles. Definite lymphoid follicles were found in half of the cases. A most striking histological finding was the frequency of the presence of subepithelial cell groups commonly known as Brunn's nests. Their presence in tissue sections warrants the histological diagnosis of urethritis cystica. In 12 cases, we found what we believe to be true mucus-secreting acini in the association with Brunn's glands. The lumina contained either pale pink-staining material resembling mucus or deep reddish brown concretions. Histologically, these glands resembled those of the male prostate so strikingly that the tissue was identified as prostate by several qualified, unsuspecting pathologists. True prostatic glands do occur in some female urethras but are far from an universal finding in obstructive lesions. There was absolutely no correlation between the histological presence of these prostatic glands and the severity of the clinical symptoms.—*Author's abstract.*

DISCUSSION ON SURGERY OF URETHRAL STRICTURE. SECTION OF UROLOGY.

Walter W. Galbraith. Proc. Roy. Soc. Med. 41:837-42, December 1948.

Urethral stricture has a gradual and frequently insiduous onset. Surgery is indicated for certain acute complications, failure to obtain satisfactory results by dilatation, or in preparation for later more efficient dilatation. Immediate operation may be necessary for relief of urgent symptoms, as with urinary retention. Great care must be exercised if there are symptoms of uremia and if the renal function is poor. Deliberate surgery is employed when all septic reactions are completely controlled. Impassable and impermeable types of strictures are the usual indications for surgery, about 70% being located a centimeter or so beyond the distal end of the membranous urethra in the bulb. A preliminary suprapubic cystotomy and bladder drainage is preferred if an instrument cannot be passed through the urethra. This permits inspection of both ends of the blocked canal and frequently permits dilatation to be accomplished after edema and spasm have subsided.

Urethrotomy does not cure but only provides an immediate and frequently only temporary relief to the most painful and dangerous symptoms. It is often followed by a recontraction worse than the first. External urethrotomy may be done by the Syme or some form of the Wheelhouse technic. The latter is preferred. Internal urethrotomy appeals to both patient and surgeon because of its rapid relief of symptoms. It has a limited application, however; too often fails to produce a lasting result; is not free of danger from bleeding or sepsis; and the subsequent recontraction may be difficult to correct.

Excision of the stricture-bearing area offers much more hope of permanent relief than any other method if the area can be entirely removed and the edges of the divided urethra accurately united, provided healing occurs with a minimum of scar formation. An illustrative case is described in which a suprapubic cystotomy was done and nothing further attempted until the perineal mass had become greatly diminished. The perineum was then opened, all indurated tissue excised, and the 2 ends of the urethra mobilized as much as justifiable without fear of necrosis. A 2 cm. gap remained even after posterior tension sutures had been inserted. A catheter was therefore passed the length of the urethra, bridging the gap, and the wound lightly closed. Both suprapubic and perineal wounds had healed well in five weeks with perfect functional result. The ends of the urethra should be sutured if they can be approximated without tension. A skin flap may be grafted across the deficiency if no sort of approximation can be made because of extensive destruction of the canal but, with modern chemotherapy, the urethral mucosa will usually proliferate quickly and cover even an extensive raw gap.

Summarizing, intermittent dilatation is the preferred method of treating

a stricture. If this fails, internal or external urethrotomy may be used on special occasions but, whenever possible, the urine should be diverted to control sepsis and the stenosis with all inflammatory induration completely excised. 18 references.

ACCESSORY URETHRAL CANAL IN THE MALE.

Peter H. Schurr. Brit. J. Surg. 36:181-4, October 1948.

There are several varieties of accessory urethral canals, the classification of Taruffin being considered best. This includes the following 3 types: (1) A seminiferous canal with 2 meati on the glans, one for urine and the other for seminal fluid; (2) blind ending canals either opening on the surface of the penis or into the normal urethra but not extending to the bladder; (3) the uriniferous canal or accessory channel opening on the surface of the penis and freely communicating with the urethra somewhere in its course. The most recent collection of cases is of 42 belonging to type 2. Most cases are asyptomatic. Occasional rare cases in which the accessory canal enters the bladder usually have partial incompetence. Similar anomalies occur in the female urethra but are rare. An illustrative case history is presented of a patient having an accessory channel which freely communicated with the urethra in the bulbar region and opened through a common external meatus with the normal urethra. Theories of development of this condition are reviewed. It is suggested that dorsal accessory canals result from a persistent pars phallica of the urogenital sinus. 31 references. 5 figures.

TRANSURETHRAL RESECTION FOR NEUROGENIC VESICAL DYSFUNCTION IN CASES OF DIABETIC NEUROPATHY.

John L. Emmett, Richard V. Daut and Randall G. Sprague, Mayo Foundation and Clinic, Rochester, Minn. J. Urol. 61:244-57, February 1949.

Vesical dysfunction is occasionally associated with diabetic neuropathy. The dysfunction is characterized primarily by urinary retention with a distended atonic bladder. It closely simulates the condition found in true tabes dorsalis. It is generally insidious in onset and development. There is a gradual increase in the intervals between voidings. Considerable straining may be needed to evacuate the bladder. In some patients urinary symptoms simulate those of ordinary prostatic obstruction. Retention in a few patients appears suddenly from an acute complicating illness or after surgery. Cystoscopy usually shows a large atonic bladder with minimal to moderate trabeculation and much residual urine which is often infected. The incidence of this complication in diabetes is obscure.

The treatment, by transurethral resection of the vesical neck, of 3 patients who had neurogenic vesical dysfunction associated with diabetes mellitus and diabetic neuropathy is described. These cases had an atonic type of vesical dysfunction which closely resembled that found in associa-

tion with tabes dorsalis of syphilitic origin. In one case moderate improvement in vesical function followed the operation; the amount of tissue in this case was not sufficient for an optimal result. The operation in the other two cases resulted in restoration of essentially normal micturition. Resection of the vesical neck improves vesical function and protects against the dangers of infected residual urine in the bladder. 22 references.

13. Penis

See Contents for Related Articles

14. Urine and Semen

STUDIES ON THE METABOLISM OF SEMEN: 4. AEROBIC AND ANAEROBIC UTILIZATION OF FRUCTOSE BY SPERMATOZOA AND SEMINAL VESICLES.

T. Mann and C. Lutwak-Mann, University of Cambridge, England. Biochem. J. 43:266-70, No. 2, 1948.

In previous studies it has been found that the reducing carbohydrate of seminal plasma is fructose. In the present experiments it has been shown that the process of fructolysis has an essential role in the life of mammalian spermatozoa under both anaerobic and aerobic conditions. Under anaerobic conditions fructolysis supplies the main source of energy for spermatozoa. Under aerobic conditions both fructose and lactic acid prolong and maintain sperm respiration. The rate of fructolysis is greater under anaerobic than aerobic conditions. By the use of a definitely determined concentration of sodium fluoride, fructolysis can be abolished completely in sperm suspension, but respiration is only partly suppressed. In such experiments, although there is still some oxygen consumption, the spermatozoa become immobile. If spermatozoa are washed free from seminal plasma, which contains fructose, they can utilize either added fructose or glucose under anaerobic conditions. The seminal vesicle, which is a fructose producing tissue, utilizes glucose but not fructose under anaerobic conditions. Under aerobic conditions, both spermatozoa and the seminal vesicles can metabolize both fructose and glucose. 16 references. 6 figures (graphs).

MORPHOLOGY OF HUMAN SPERMATOZOA. OBSERVATIONS WITH THE ELECTRON MICROSCOPE.

Ormond S. Culp and John W. Best, Henry Ford Hospital, Detroit, Mich. J. Urol. 61:446-56, February 1949.

Spermatozoa from 65 patients were studied with the electron microscope which offers magnifications 50 times the maximum possible with conventional

light microscopy. Heavy secretions from the accessory glands interfered with previously reported observations but were controlled in this study by treating the ejaculate with 2% sodium bicarbonate. Potential optical aberrations, artifacts due to the preparation of specimens, effect of the necessary vacuum during actual study, and the limitations of black and white photography demanded extreme caution when one attempted to interpret the electron micrographs.

The normal sperm head proved to be ovoid, flattened at the tip, occassionally surrounded by a protoplasmic cap or envelope and frequently contained less dense areas. Extending from the head through a short neck, spiral body, and long, narrow tail were discrete, delicate fibers which emerged from the sheath at the tip of the tail as 10 to 12 fine terminal fibrils. Variations from normal were observed in each of the 4 main anatomic divisions of the spermatozoon (head, neck, body, tail). Some of these proved to be rather bizarre. Despite these new anatomic findings, all male infertility could not be explained on a purely morphologic basis. 6 references. 1 table. 13 figures.—*Author's abstract.*

THE BIOLOGICAL ASPECT IN TREATMENT OF THE INFERTILE MARRIAGE.

R. Christie Brown, City of London Maternity Hospital, London, England. Brit. M. J. 4584:851-53, Nov. 13, 1948.

Investigation of the infertile marriage has been surgical or mechanical rather than medical and, in the author's opinion, sufficient attention has not been given to faulty nidation as a cause of failure of conception and of miscarriages. Treatment aimed at ensuring good nidation has proved successful in many cases.

Extended observation of endometrial biopsies led the author to believe that frequently the initial hormonal stimulus from the corpus luteum, or the endometrial response to the stimulus, was deficient. He therefore advised patients to adopt the following plan before conception was attempted: (1) To concentrate intercourse on the fertile days, calculated from an early morning temperature chart; (2) to abstain from intercourse for ten days prior to these days; (3) to take, from the first fertile day, 0.6 mg. Dienoestrol and 10 mg. Ethisterone daily, the latter tablets to be used as linguettes, and (4) to continue these hormones until the onset of the next period or until the 18th week of an ensuing pregnancy.

One hundred and eleven patients, sterile for at least two years from no apparent cause, were given this treatment prior to investigation. Within six months, 38 (34.2%) became pregnant. Three miscarried but 35 gave birth to live babies. Thirty-eight nulliparous patients suffering from repeated miscarriage were also treated. No cause for miscarriages had been found but in 30 of the cases, the semen had been reported sub-fertile. Within six months, 28 became pregnant and 20 were delivered at term of live babies. This treatment is based on the fact that embryonic development depends upon genetics and environment, and the hormones are administered to

render the uterine environment favorable from the beginning. It is of use where infertility is due to inadequate semen since, by preparing the soil, one can compensate for genetic weakness of the seed. Many miscarriages may result from faulty nidation due either to poor soil or poor seed. Development depends upon the interplay between the genetic and environmental factors and preparation for nidation must be regarded as one of the latter. The fact that the corpus luteum is stimulated by fetal prolan indicates that the mammalian embryonic environment is genetically determined and thus the fetus is responsible for stimulating its mother's hormones. This is a form of natural selection to ensure eviction of poor stock. The author therefore administers these hormones only until the eighteenth week at which time the pregnancy hormones, estrogen and progesterone, are elaborated entirely by the fetal chorion. The fetus should then be allowed to fight for its life because to supply hormonal support at this stage would, in the author's opinion, be dysgenic. 7 references. 2 tables.—*Author's abstract.*

15. Scrotum

GUNSHOT WOUNDS OF THE GENITALS.

James M. Campbell, Saskatoon, Sask. Canad. M. A. J. 60:32-35. January 1949.

Twenty major genital cases form the basis of the discussion. Genital wounds are of great importance and primary suture is the method of choice. Roentgenograms are very helpful. Suprapubic cystotomy should be done in most cases of urethral wounds; the suprapubic tube should be large.

The scrotum is involved in almost all genital wounds. The only special point in connection with mutiple small wounds of the scrotum is the importance of excision and making sure there is no urethral wound. Urethral injuries can occur without blood at the meatus and without difficulty in passing a catheter to the bladder.

Severe damage to both testes is very infrequent because of the great mobility in the membranes. The aim of treatment is to be conservative and to close the organ. The penis is seldom amputated and most wounds found are tangential, or through and through. There is frequently damage to penile skin. The procedure here is the same; if a urethral injury is found, a suprapubic operation is done. Only dead skin should be removed. Wounds of the glans heal very well with excision and primary suture. Where the meatus is involved, the urethral epithelium must be carefully sutured to the skin; it is important to leave an oblique mouth in the new meatus. Wounds of the body of the penis follow general lines of treatment: excision and arrest of bleeding; suture of the penile fascia and the urethra. 0 references.

16. Testis

EFFECT OF X-RAYS ON FERTILITY IN WHITE LEGHORN MALE CHICKENS TREATED BEFORE PUBERTY.

Paul D. Sturkie, Ph.D., John A. Pino, B.S., Rutgers University, New Brunswick, N. J.; J. L. Weatherwax, M.A., A. J. Donnelly and G. M. Dorrance, American Oncologic Hospital, Philadelphia, Pa. Radiology 52:112-17, January 1949.

White Leghorn male chicks, 4 to 6 weeks of age, were irradiated with 1200 to 8400 r. The area irradiated included the testes, adrenals, and a part of the kidneys. These males were allowed to reach maturity and the effects of the x-rays upon mating behavior, comb growth and fertility in actual matings were studied. Histological studies were made of the testes of the various groups. Most of the males receiving 2,100 to 2,800 r were sterile when mated to females at maturity, whereas with doses of 1,600 r or less most or all were fertile. All males receiving 5,600 and 8,400 r were sterile. The treatments had no effect upon comb growth and mating behavior. The testes of the irradiated males were reduced in size, the decrease being proportional to dosage, though some of the observed differences were not significant. This work shows that the histologic state of the testes is not always a reliable criterion of fertility. Of the sections studied from the testes of adults males receiving the different treatments, those from only one male suggested that there was any recovery from the treatment. 7 references, 1 table, 3 figures.—*Author's abstract.*

EMBRYONAL ADENOCARCINOMA OF THE TESTICLE IN A THREE-YEAR-OLD CHILD. REPORT OF A CASE.

Arthur Rosenblum and Martin A. Robbins, Chicago, Ill. J. Pediat. 33:627-29, November 1948.

A case is presented of carcinoma of the testicle in a 3 year old child, together with a brief review of the literature as to the incidence and types of carcinoma of the testis in children. The patient was hospitalized for bronchopneumonia, and responded promptly to medical management. It was discovered in the course of the admission physical examination that the right testicle was enlarged, insensitive, nodular, firm, and did not transilluminate. Clinical diagnosis of tumor of the testicle was made, and orchidectomy performed, followed by radiation therapy.

On section, the testis was occupied almost entirely by a soft tumor presenting a pleomorphic appearance. Some portions were red, others a bright yellow. The epididymis and vas were normal. Histologically, tumor cells were seen arranged in pseudoglandular formation, lying in a loose stroma. Cells were large, and varied markedly in size and shape. Numerous mitotic figures were present. Pathologic diagnosis was embryonal adenocarcinoma of the testis. 5 references, 2 figures.—*Author's abstract.*

MALIGNANCY IN CRYPTORCHIDISM.

William A. Carroll, San Francisco, Calif. J. Urol. 61:396-404, February 1949.

For the past one hundred years, the medical literature has stated that an undescended testicle is more likely to become malignant than a scrotal testis. In recent years, this contention has been modified so that the ectopic residence or maldevelopment of the cryptorchid is not regarded now as the cause of the malignant changes but it is claimed that the statistics definitely show a higher ratio of incidence when the figures for undescended testicles as a whole are compared with those for malignant cryptorchidism (20 to 55 times higher than could be expected by mere chance association).

Malignancy of the testes is a rare tumor (about 0.05% of all male patients and about 0.58% of all malignancies). Two hundred and seventy deaths from testicular tumors are reported annually in the United States and approximately 9 to 15% (25 to 40 of these) are in cryptorchids.

Study of the available statistics revealed that they are inaccurate and open to reasonable doubt, particularly in their attempt to establish a low incidence for benign undescended testes. The quoted hospital records do not supply acceptable figures on the *anatomical* frequency of undescended testicles; the hospital diagnosis sheets give only the *pathological* frequency and diagnoses as they enumerate only those patients actually treated for cryptorchidism.

A survey of all the urologists in the American Urological Association and Western Section A.U.A. was made asking their personal experience and 662 replies were received. Seventy-six per cent of A.U.A. members and 81% of Western Section A.U.A. members declared they had never seen or personally treated a malignant cryptorchid. Most respondents doubted the incidence reported in the literature but could not refute the claims from their own personal experience.

A sum total of 285 malignant undescended testicles was reported (220 by 126 A.U.A. members and 65 by 33 Western Section A.U.A. members). Two members of A.U.A. reported the largest series of 7 cases each but no other man had seen more than 4 cases. An increasing number of testicular malignancies after orchidopexy was remarked on by members seeing them in the service hopsitals in World War II. It was the consensus of opinion, however, that malignancy after orchidopexy would have developed regardless of whether the gland was in the scrotum or in its previous cryptorchid location.

The cryptorchid position of the testis results in the maldevelopment or lack of development of the spermatogenic elements of the testes with a relative increase in the interstitial cells; true atrophy with loss of all cellular elements occurs only after puberty and possibly as late as twenty years of age. To avoid this atrophy and permit the development of spermatogenesis, orchidopexy into the scrotum is necessary between the eighth and twelfth year.

Malignant cryptorchidism should be classified with testicular malig-

nancies in general, not as a separate entity. The anatomical location has no bearing on the incidence of malignancy. The frequency of malignancy in cryptorchidism is so minute that it should never be used as an indication for either orchidopexy or orchidectomy. 52 references. 4 tables.—*Author's abstract.*

ORCHIOPEXY. A CRITIQUE.

Leonard Paul Wershub, New York Medical College, New York, N. Y. J. Urol. 60:631-35, October 1948.

No discussion of the many unproved theories of imperfect descent of the testis is made in this paper, but reference is made to McGregor's principle of a third inguinal ring, and its role in imperfect descent of the testes because of its anatomical and surgical significance.

The author believes that adequate attention has not been given to McGregor's third inguinal ring, and that probably this is due to the lack of accurate and detailed knowledge of the subject, as well as inadequate text book references. He further states that confusion concerning the anatomy of the superficial fascia of the lower abdomen and groin exists to a far greater extent than we are prone to admit.

A clearer understanding of the fascial structure of this area, which is of anatomical, clinical and surgical significance, is obtained from McGregor's studies of this area of the body. Such information and general knowledge are of undisputable value in a consideration of what technic to apply in orchiopexy.

The author then considers the anatomical and surgical phases of orchiopexy, with special emphasis on the difference between the so-called Bevan operation and the Torek operation.

The significance of the elastic fibers in the scrotum as elaborated by Vermooten is presented, and a plea is made for utilization of this anatomical data.

With proper consideration of applied anatomy in the surgery of orchiopexy, the author believes there is no need for the two-stage procedure as advocated by Torek, but favors the Bevan operation. 7 references. —*Author's abstract.*

17. Epididymis

SEASONAL CHANGES IN THE TESTES, EPIDIDYMIDES AND SEMINAL VESICLES OF DEER INVESTIGATED BY HISTOCHEMICAL METHODS.

George B. Wislocki, Harvard Medical School, Boston, Mass. Endocrinology 44:167-89, February 1949.

The testes, epididymides and seminal vesicles of Virginia deer exhibit seasonal changes in respect to their weights and histological appearances (Wislocki, Essays in Biology. Univ. Calif. Press, pp. 631-653. 1943). In the

latitude of New England, they increase in weight and reach maximal activity in the fall (October, November), followed by a marked decline in weight and suppression of secretory activity and spermatogenesis in the spring (May, June).

In the present investigation these organs are compared in their active and inactive states with reference to lipids, steroid hormones, glycogen and acid and alkaline phosphatases. The cells of the interstitial tissue in the fall contain lipid droplets which are sudanophil and birefringent, give a positive plasmal reaction, exhibit yellow fluorescence and are soluble in acetone. The combination of these reactions indicates that steroid hormones are formed in the interstitial tissue. In June testes these reactions are much less intense. The interstitial cells contain traces of alkaline phosphatase and a little cytoplasmic basophilia, but no glycogen. The walls of the arterioles and the basement membranes surrounding the seminiferous tubules are rich in alkaline phosphatase but this disappears in the inactive period.

The cells of the seminiferous tubules of the active fall testes contain large amounts of both acid and alkaline phosphatases. Alkaline phosphatase is present in the cytoplasm of the germinal cells, being particularly intense in the spermatids. The nuclei are less deeply stained. Acid phosphatase occurs in both nuclei and cytoplasm of the germinal cells, the cytoplasmic reaction reaching maximum intensity in the spermatids. Both acid and alkaline phosphatases appear to be present in the cytoplasm of the Sertoli cells, and they occure also in the cyptoplasm cast off from the spermatids into the lumen of the tubules. In June these enzymes are greatly decreased.

Glycogen occurs in some of the Sertoli cells in active testes, while in inactive ones it is present in many of the tubular lumens. The acroblasts and acrosomes of the spermatids, as well as the heads of the spermatozoa, are stained red by the periodic acid-Schiff method, a reaction not prevented by the use of saliva and indicative of a glycoprotein. The cytoplasm which is cast off by the spermatids contains lipid droplets, basophilic substance, alkaline and acid phosphatases, and a glycoprotein which reacts with the periodic acid-Schiff reagents.

The cells lining the ductus epididymidis contain both acid and alkaline phosphatases. The former is localized principally in the nucleus, distal cytoplasm and ciliated border of the columnar cells. The enzyme delineates the terminal bars at the surfaces of the cells. Alkaline phosphatase is localized in the ciliated border of the columnar cells and in the cytoplasm of the small basal cells. Lymphocytes, whose nuclei contain acid phosphatase, are seen migrating through the epithelium of the ductus epididymidis.

The spermatozoa exhibit various reactions. Their heads, besides being stained by the periodic acid-Schiff technique, are faintly stained by sudan black B. Both acid and alkaline phosphatases occur in the spermatozoa. The latter seems to be present in the cytoplasmic sheath covering the head. By Bodian's protargol method the heads are very sharply delineated: the anterior head cap stains grey and the posterior cap black, with a narrow intervening zone which is unstained. Seasonal changes, in reference to size and secretory activity, are noticeable in the seminal vesicles. The seasonal

distribution of acid and alkaline phosphotases, lipids and glycogen in these glands is briefly described. 17 references. 6 plates.—*Author's abstract.*

18. Spermatic Cord and Vas

INTRA-ABDOMINAL HYDROCELE.

W. McClelland, Northern Nigeria. Brit. M. J. 4590:1122, Dec. 25, 1948.

A case of this uncommon condition is briefly described. The patient had a rather large hydrocele which was tapped. The proper diagnosis was realized after 3 pints of fluid were drawn off and more continued to come. A finger passed up the inguinal canal entered a large abdominal sac still containing fluid. About 3 more pints were expelled by pressure on the lower abdomen. The abdominal sac was easily delivered into the scrotum by moderate traction. This supports the belief that the abdominal sac in these cases is formed by a distended funiculo-vaginal process. 0 references.

19. Seminal Vesicles and Ejaculatory Ducts

RE-ANASTOMOSIS OF THE VAS DEFERENS. CASE REPORT.

William L. Huffman, Cleveland, O. J. Urol. 60:643-44, October 1948.

A 26 year old man had a bilateral vas ligation performed for sterilization purposes three years previously. He has since remarried and desires children. Examination shows both vasa palpable below the external ring and absence of spermatozoa in semen specimens.

Scrotal incision was made and the separated vas segments cut back until patency was observed. Steel wire, 20 gage, was passed through the lumen of each segment and out the corresponding wall, bringing the severed ends together, and then through scrotal skin where the wire was fixed with shot. Adventitia was approximated with fine gut. On the seventh postoperative day the wire was withdrawn.

Two and one half months later semen showed many motile sperm. 5 references.—*Author's abstract.*

20. Prostate and Verumontanum

URINARY INCONTINENCE FOLLOWING PROSTATECTOMY. ITS CURE BY NONOPERATIVE TREATMENT.

Albert Vergés-Flaqué, New York Hospital, New York, N. Y. J. Urol. 61:96-101, January 1949.

Following prostatectomy, the majority of patients have perfect urinary control. There is a small group who suffer temporary incontinence, which disappears spontaneously after several weeks or months. There is an even

smaller group whose incontinence seems to resist all forms of treatment and who have to wear urinary receptacles.

Ten cases, belonging to the last group, are reviewed. Incontinence in this group had endured from one month to five and a half years, regardless of the type of treatment received.

A very thorough examination was made of each patient, including urinalysis, rectal palpation, urethral calibration, cystoscopy, endoscopy, and cystometry.

The most important step of the examination was determining the ability of the external sphincter to contract and relax; this was accomplished endoscopically. Nine patients showed contraction and relaxation of the external sphincter in all its circumference when the patient was instructed to "start and to stop urination." It was in this ability of the external sphincter to contract at the volition of the patient that dependence was placed for the success of the treatment.

On the other hand, the internal sphincter had been injured to a greater or lesser degree in all cases; and endoscopically it was observed that such fibers as remained did not contract voluntarily, nor did they show any ability to stop a flow of water at low pressure.

The second most important step was determining the ability of the external sphincter, upon contraction, to stop a flow of fluid going *into* the bladder against the highest possible pressure as registered in a water manometer; this being known as the *maximum sphincteric contraction pressure.*

The author describes a series of carefully conducted and watched exercises done by the patient with the purpose of developing the contractile power of the external sphincter in coordination with the perineal and abdominal musculature. These exercises were done under the constant supervision of a doctor.

The duration of the treatment was from one to eleven months. Nine of the patients were able to dispense with rubber urinals or clamps, and kept dry for from two to five hours during the day, holding from 200 to 300 cc. of urine in the bladder. One was a total failure; he had a functionless external sphincter. 2 tables. 1 figure.—*Author's abstract.*

PRACTICAL CONSIDERATIONS IN THE USE OF HIGH FREQUENCY CURRENTS FOR TRANSURETHRAL PROSTATECTOMY.

Henry M. Weyrauch, J. Brandon Bassett and Max M. Berger, U. S. Veteran's Administration Hospital, Fort Miley, San Francisco, Calif. J. Urol. 61:371-83, February 1949.

High frequency currents used in electroresection of the prostate were evaluated, and the factors causing the destruction of tissue were studied by two method: (1) by finding the temperature rise in the region around the active electrode: and (2) by noting the gross changes resulting immediately.

Results indicate that coagulating currents are most destructive and must be employed cautiously. Though a coagulating current with a dial setting of 30 caused no damage beyond a 3 mm. radius during application up to fifteen seconds, higher dial settings caused greater zones of destruction even in short time intervals. The radius of the destroyed zone is proportional to the intensity of current and time of application. This provides danger of perforation when coagulation is done near the prostatic capsule, and the greater is the danger of urinary incontinence when it is done near the external urinary sphincter. A low intensity with a setting of about 30 should be used.

The spark gap coagulating current causes more destruction than a tube coagulating current; however, the former surpasses the latter in speed and efficiency of coagulation, and is ordinarily preferable. Exact point coagulation should be used to limit tissue destruction and prevent formation of a crust.

Cutting currents are less destructive and do not produce zones of coagulation as do coagulating currents. Ideally there is no gross evidence of surface charring. No tissue is destroyed beyond a radius of 3 mm. from the loop, regardless of the type or intensity of the current, or the speed of the cutting stroke. The cutting stroke should be rapid, with a current of sufficient intensity. Increasing the intensity does not appreciably widen the danger zone. A rapid cutting stroke prevents charred tissue from adhering to the loop and eliminates tags and frayed edges.

Tube current is more efficient than spark gap current and produces less surface charring. It is more satisfactory for cutting purposes.

Other important factors are: the size of the active electrode, the moisture content of the tissue, and the dispersion of heat into the irrigating medium. The smaller the loop diameter, the more concentrated are the electrical waves, and the more its cutting efficiency. Cutting is done better in tissue with higher mositure content. 3 references. 1 table. 10 figures.

EVALUATION OF TRANSURETHRAL PROSTATECTOMY.

John A. Taylor and Charles H. Place, New York, N. Y. J.A.M.A. 139: 144-47, Jan. 15, 1949.

Evaluation of transurethral prostatectomy is based on 1,066 cases. There were 957 cases of benign lesions and 109 cases of carcinoma with retention. The lumbosacral subarachnoid tap has been used almost exclusively for anesthesia.

In 205 cases another resection was necessary during the first admission. There were 18 patients who had postoperative hemorrhage; 12 were controlled by evacuation of clots and fulguration of the bleeding point, while 6 required suprapubic operation. There were only 5 deaths in the series. There were 16 cases of stricture of the urethra following operation. The urethras have been dilated gradually and the No. 24 resectoscope has been used in some of the smaller urethras. There were 3 cases of incontinence. The shortest time interval between resections was one year; the longest

interval was twelve years. When a patient bleeds after several years, the bleeding is usually caused by a recurrence of his prostatic growth. Infection is always a problem in transurethral surgery. Its incidence has been reduced by antibiotics, absence of the indwelling catheter preoperatively where possible, the effort to have patients empty their bladders before leaving the hospital, and early removal of postoperative catheters in patients who have not required postoperative drainage. 1 reference.

STATUS OF PERINEAL PROSTATECTOMY TODAY.

Daniel R. Higbee, Denver, Colo. J.A.M.A. 139:141-44, Jan. 15, 1949.

There are four methods to manage prostatic obstruction surgically: suprapubic, retropubic, transurethral resection and perineal prostatectomy. Each method has advantages and disadvantages. Perineal prostatectomy is the one operation by which almost any change encountered can be adequately dealt with. It is done under complete visual control. Position during operation is unpleasant and may be associated with respiratory or cardiac embarrassment.

A series of 350 cases is presented, composed of 334 simple enucleations, 2 subtotal prostatectomies and 14 radical perineal operations. In the first group of 336 patients, 6 died. Complications developed in 39 cases, postoperative hemorrhage in 13, rectal injury in 11, pulmonary complications in 13, acute pyelonephritis in 2, cardiac disease in 4, toxic dermatitis in 2, and ligation of the left ureteral orifice requiring release in 1.

To avoid incontinence after perineal surgery, certain methods must be followed: (1) strict following of lines of cleavage, especially in separating the apical attachment of the recto-urethralis; (2) avoidance of unnecessary dissection; and (3) gentleness and care in retraction in the region of the perineal body and external sphincter. In this group of cases, some degree of difficulty in holding urine immediately after starting to void was present in 17%, remaining to some degree in 10% at one month and in 3% after 3 months. There was no mortality in 25 patients who were 80 years or over. It is concluded that conservative perineal prostatectomy can be done at any age with low mortality, little blood loss, few complications and good end results.

Occasional surprisingly good results have been obtained in inoperable patients with cancer of the prostate, but surgical removal today is the only effective method of producing a cure. Of 12 patients, 4 were castrated because of suspected or proved malignant growth beyond the prostatic capsule. Evidence of progression of the growth by rectal examination is absent in 1 case after three years, absent in 2 cases after two years, and in 1 case after eighteen months.

Of 8 patients operated on by radical excision and partial removal of seminal vesicles, but without castration, 5 are alive; all patients were prepared by catheter drainage and diethylstilbestrol daily for ten to fourteen days. Operability is usually facilitated by diethylstilbestrol. Following operation convalescence was usually uneventful. 3 references.

OSTEITIS PUBIS. ITS DIAGNOSIS AND TREATMENT.

Lawrence L. Lavalle and Frank C. Hamm, Brooklyn Hospital, Brooklyn, N. Y. J. Urol. 61:83-90, January, 1949.

Osteitis pubis is an inflammatory disease of the pubic bone beginning in the symphysis and rapidly involving the pubic rami and even the ischia. It characteristically follows suprapubic incision for prostatectomy or other urinary bladder procedures in a small number of cases. The disease is a distinct entity and follows a definite course. While the disease is self-limiting under expectant treatment, a period of prolonged pain and disability (three to twelve months) has been the rule in a study of the first 25 reported cases in the literature. Seven cases have been studied at the Brooklyn Hospital and form the basis for this review. A new therapeutic regimen, as instituted in our hospital, has produced rapid amelioration in a matter of days instead of months and will be described in detail.

Undoubtedly many mild cases of osteitis pubis have gone undiagnosed in the past. In the typical instance, the patient has had a suprapubic prostatectomy from three to seven weeks before the onset of symptoms. The suprapubic wound and sinus are firmly healed and the urine is now clear, or nearly clear. Without prodromal symptoms he is suddenly seized with pain over the symphysis pubis. In a matter of a few days the pain becomes excruciating and involves one or both pubic rami. The patient experiences great difficulty in locomotion; movement of the lower extremities produces pain along the inner surface of the thighs accompanied by spasmodic contractions of the adductor magnus muscles. He lies in bed flat on his back, as turning to one side or the other is likely to bring on a new adductor spasm.

On examination, it is immediately evident from the facial expression that severe pain, or fear of pain, is present. He walks to the examining table with short deliberate steps or with a hesitating shuffling gait. He may walk on the tips of his feet in order to spare himself pain transmitted from the heels. An attempt by the examiner to spread the thighs is immediately resisted as a painful spasm of the adductor muscles is produced. The slightest pressure over the pubic spine, such as would be normal in the course of an examination, produces exquisite pain. If the process extends down to the ischial rami he finds sitting in bed painful. No swelling or redness is noted in the pubic region. A low-grade febrile reaction is generally present. Associated with this is a moderate leukocytosis, polycytosis and secondary anemia.

No roentgen changes were noted in the earliest stage of this disease. In this series clinical signs appeared in three to seven weeks. X-ray corroboration of osteitis pubis was not noted until four to thirteen weeks after the second-stage operation. In an individual case, x-ray confirmation is not found until one to nine weeks after the onset of symptoms. Hence, repeated studies at weekly intervals are necessary to elicit the earliest roentgen changes to confirm the diagnosis. At first, a fuzziness or fraying of the periosteum of the symphysis or pubic ramus is seen. Within two more weeks the moth-

eaten appearance of bone destruction in the pubic ramus is manifested. The appearance is not unlike the lytic process seen with metastases from a prostatic carcinoma or from some inflammatory involvement of the bone.

It was promptly evident that sulfonamides and penicillin were futile in the treatment of osteitis pubis. Believing that we were dealing with a trophic disturbance, treatment with high vitamin B complex, intramuscularly twice a day, along with daily shortwave diathermy, was instituted. Improvement as manifested by relief of pain was noted in 6 cases in from two to five days. In 1 case where this treatment failed, roentgen therapy as advised by Goldstein and Rubin produced a good response.

Early recognition of this complication will enable the physician to assure the apprehensive patient that no serious consequences will ensue and that improvement will occur. He can be assured that no organs or structures will be involved.

The authors believe that if a retropubic approach for prostatectomy becomes more popular the incidence of osteitis pubis will increase. The occurence of osteitis pubis in our series of retropubic prostatectomies was 4%. 18 references. 4 figures.—*Author's abstract.*

RETROPUBIC PROSTATECTOMY: EXPERIENCES BASED ON 757 CASES.

Terence Millin, C. L. O. Macalister, P. M. Kelly, Westminster Hospital, London. Lancet 6549:381-386, March 5, 1949.

In 919 cases of prostatic obstruction the great preference is for the retropubic approach when dealing with the "enucleable" gland. The endoscopic route is reserved for minor subcervical lobes and a medium-sized gland in the poor surgical risk. The open method is being increasingly used for the lattter group.

In the fibrous prostate group a large number were subjected to the open operation. The operation of choice for most scleroses of the vesical neck is a transurethral resection. There were no deaths in 23 cases and the functional results were good.

The group with calculous prostatitis includes the small, sclerotic, infected, calculous gland which defies digital enucleation. The open operation is preferred because of greater completeness and better functional results. In less infected cases an intracapsular procedure is used; for more infected glands and for older men, radical subtotal prostatectomy is preferred.

In carcinoma of the prostate the radical operation is used. Estrogen therapy is followed for one month and then the patient is given a complete retropubic extirpation of prostate, vesicles, and half the bladder base. The immediate results are gratifying.

In preliminary investigation intravenous urography is used. Blood urea is determined routinely. Unnecessary urethral instrumentation is avoided. In general the endoscopic examination is made as a preliminary part of the operation. In chronic retention, especially if there is evidence of uremia or suburemia, an indwelling catheter is used. In acute retention where the

general condition is good, an indwelling suprapubic trochar is used. Where operation must be delayed a tied-in No. 15 Ch. rubber Tiemann or small Foley catheter is used.

Of 723 cases of benign prostatic obstruction operated on by the retropubic route, the procedure was secondary in 50. Of these 50, 28 had preliminary suprapubic cystostomy previously. Urethral catheter drainage is generally used where decompression is required; if there is no improvement with this therapy, the suprapubic tube is used.

Complications are fewest after retropubic operations. In 757 cases, only 2 deaths were attributed to pelvic cellulitis. Osteitis pubis is becoming more common but it is self limiting. The average incidence of suprapubic fistula was 4.5%. Frank hematuria demands careful watching. The average incidence of secondary hemorrhage was 8%. Incontinence was persistent in only 2 cases. Pulmonary embolus occurred 11 times. Funiculitis develops in some cases.

Of 724 cases of benign prostatic obstruction, there were 33 deaths. The average hospital stay in 88 one-stage retropubic prostatectomies for benign prostatic obstruction was 16.4 days. 26 references.

RETROPUBIC PROSTATECTOMY: REPORT OF 102 CASES.

Samuel K. Bacon, University of Southern California School of Medicine, Los Angeles. J. Urol. 61:75-77, January 1949.

Retropubic prostatectomy was done on 87 patients from the County Hospital and 15 private patients. The private patients only were carefully selected; the results in this group were excellent: no mortality or significant complication, average voiding on the sixth postoperative day, and discharge on an average of 8.2 days. The majority of County Hospital patients had severe urinary infection and were poor surgical risks.

The average age of the series was 74 years. The initial emergency in 75% was complete urinary retention. In 89 cases the urine was moderately or severely infected. There was a remarkable incidence of cardiorenal-vascular disease with hypertension. Other important findings were: hematuria, anemia, pneumonia, diabetes, hemiplegia, urethral stricture, vesical diverticula and urinary calculi.

Six specimens were malignant. The mortality rate in 102 cases was 6.8%. Postoperative hospitalization averaged 17.1 days, chiefly because most patients were poor surgical risks. In 6 cases postoperatively, there was severe hemorrhage. Excising a posterior section of tissue from the bladder neck was not routinely done. In 7 cases this resulted in contracture of the vesical neck necessitating endoscopic resection or division with a diathermy knife.

Before operation, investigation and refresher study of the space of Retzius is suggested. The operation gives increased comfort during convalescence, prompt urinary control, and preservation of sexual potency. It is most useful for complete exicision of large or medium hyperplasias. 9 references.

RETROPUBIC PROSTATECTOMY.

David Presman and Harry C. Rolnick, Cook County Hospital, Michael Reese Hospital, and Chicago Medical School, Chicago, Ill. J. Urol. 61:59-74, January 1949.

Retropubic prostatectomy is a sound surgical method. A detailed description of the operative technic, modified after Millin, is presented.

Forty cases are analyzed. There were 26 white and 14 Negro patients. Urinary retention occurred in 33 patients before admission, and many of these had been catheterized repeatedly previously. Eight patients were in good condition, 15 fair and 17 poor.

There were 3 operative deaths. In most cases a careful prophylactic suturing of the anterior prostatic plexus of veins was done. Before closing the abdominal incision, the field was examined for bleeding points which were controlled with suture or ligature. No postoperative shock occurred in this series. Nine patients had temperatures of 101 F. or greater postoperatively. All except 6 patients were discharged from eleven to fourteen days postoperatively. There was 1 case of severe hemorrhage from the anterior prostatic plexus with a fatal result. In one third of the patients, catheter patency was maintained by intermittent irrigation of the urethral catheter for the first day. Secondary bleeding occurred in 5 patients and was controlled by an indwelling catheter for one day. Suprapubic urinary drainage occurred in 9 patients; with reinsertion of a catheter for forty-eight hours, no further leakage occurred in any patient. Every case showed a mild to moderate degree of seropurulent drainage from the lower angle of the wound. This spontaneously ceased and all wounds healed in fourteen to twenty-one days. Clear or slightly hazy urine by the fourth to six postoperative week was seen in almost all cases. In some instances the urine was cloudy for six to twelve weeks. There was a short duration of postoperative diurnal and nocturnal frequency. Within eight weeks urinary habits were in the normal range. There was no instance of postoperative stricture of the urethra or vesical neck. In 3 patients who developed epididymitis postoperatively, this subsided with the usual treatment. Periostitis pubis occurred in 1 patient and was probably caused by Deaver retractors. There was no instance of diffuse retroperitoneal cellulitis with high fever and toxicity. Urinary incontinence, urinary retention, ascending pyelonephritis, pelvic thrombosis, or pulmonary embolism did not occur in any patient.

In this operative method the following details must be observed: (1) elevation of the pelvis; (2) extension of the lower end of the abdominal incision practically to the base of the penis; (3) continual retraction of the bladder backward and upward; (4) prophylactic suture-ligature of the anterior prostatic venous plexus; (5) enucleation of the prostate from the distal end or apex up toward the vesical neck; (6) excision of a wedge from the floor of the vesical neck; and (7) use of a guy suture through the lower flap of capsule for closure of capsular incision. 5 figures.

EXPERIENCES WITH RETROPUBIC PROSTATECTOMY.

Thomas D. Moore, John Gaston Hospital, Memphis, Tenn. J. Urol. 61:46-58, January 1949.

A comparatively brief experience with 46 consecutive retropubic prostatectomies following fairly closely the technic described by Millin is discussed. In an endeavor to evaluate and compare the procedure with primary suprapubic prostatectomy and transurethral prostatic resection, a similar number of consecutive cases treated by these two approaches, respectively, are also reviewed. The analysis of the data derived from this study indicates that the comparison is fair in that all of the patients were of a similar age group, averaging 70 years, and were suffering from essentially the same degrees of prostatic obstruction and had much the same infirmities. Their examinations and preliminary preparations were along the same lines, as was also their postoperative care. Although the series is small and does not warrant the drawing of conclusions, there is definite evidence that retropubic prostatectomy is an operation perhaps more easily mastered than transurethral resection but somewhat more difficult than removal of the prostate suprapubically. The impression has been gained from this brief experience that the patients are more comfortable in the immediate postoperative period, healing is prompt, the operation incurs no greater risk and the period of hospitalization is shorter than in those dealt with suprapubically, and about equal to those treated transurethrally. In my experience the most serious deterrent to the retropubic approach is the late complication of osteitis pubis, which developed in 8 of the 46 cases (17%) with the onset varying from two weeks to as late as five months after the operation. In 6 of these the incision had healed per primam without the slightest evidence of infection. Should the prevention of this distressing complication prove to be possible, the operation will probably become a standard surgical procedure in urologic practice and perhaps will replace to a great extent suprapubic prostatectomy for hypertrophies of unusually large degree. 8 references. 1 table. 2 figures.—*Author's abstract.*

RETROPUBIC PROSTATECTOMY. A NEW ROUTE OF APPROACH TO THE PROSTATE. *(Prostatectomia retropubica. Una nueva via de accesso a la próstata).*

Manuel E. Pesqueira, Hospital General, Mexico City, Mexico. Rev. Urol., Mexico. 6:557-76, No. 6, Nov.-Dec. 1948.

Eight prostatics have been operated upon by the author, using the method of Millin, since May of the present year. At first the hemostatic sound of Foley, with its covering of Oxycel, as recommended by Lowsley and Gentile (J. Urol. 59:281-96, 1948), was employed. The hemostatic sound has been abandoned, however, and the original technic of Millin used. The operation is regarded as very satisfactory and expected to become more so with added

experience. There has been no mortality and the complications observed are those to be expected in any type of operation practiced on the prostate in this type of patient.

The author, from his own experience and the study of those of other urologic surgeons, believes that retropubic prostatectomy will markedly reduce the indications for endoscopic resections; this latter method, nevertheless, retains its indications for prostatic bar, the fibrous prostate, small hypertrophies and inoperable cancer. The method has marked advantages over the perineal and suprapubic routes in that it is easier to perform, exposes the patient to less danger and permits a shortened hospitalization. In fact, its advantages seem so great that this report hastens to introduce the details of operative technic to the urologic surgeons of Mexico before worthwhile statistics have as yet been attained in Mexico itself. 14 references. 7 figures.

THE CORRELATION OF CLINICAL EXPERIENCE AND HETEROLOGOUS GROWTH OF HUMAN PROSTATIC CANCER.

Clyde L. Deming, Yale University School of Medicine, and New Haven Hospital, New Haven, Conn. J. Urol. 61:281-90, February 1949.

Human prostatic cancer was successfully transplanted into the eyes of guinea pigs through 16 successive generations without the selection of animals susceptible to cancer. Some transplanted tumors filled the anterior chamber of the eye in twenty to twenty-five days; others lay dormant for months and then grew. The more cellular the tumor the greater is its chance for growth. Physiologically, heterologous transplants resembled cancerous growths seen in patients. Clinically some grow fast and others slow. Heterologously some transplants grew as much in volume in three weeks as others did in several months. Testicular androgen appears to be necessary to initiate growth of prostatic cancer which has never been found in men castrated early in life. Transplanting prostatic cancer to the castrated male animal was unsuccessful. Clinically and heterologously, prostatic cancer showed great variation in response to the female hormone. Chemically, after estrogen therapy and after heterologous transplantation, it lost its acid enzyme production. Morphologically, heterologous growths have displayed no change in 16 consecutive generations.

Prostatic cancer in the animal becomes refractory to the ordinary amounts of estrogen. With larger doses of estrogen with or without castration, almost 100% of patients are relieved from pain for a short period. Any dose over 40-50 mg. per day is a large dose. Prostatic cancer, clinically and heterologously, after varying periods of growth, becomes tolerant of estrogen. This suggests that the greatest benefit from its use may be expected by greater hormonal imbalance applied early in the disease. Hormonal treatment alone is not the answer to the cure of cancer of the prostate; some other factor is needed to control growth of the tumor. 23 references. 1 table. 2 figures.

RADICAL PERINEAL PROSTATECTOMY FOR CANCER OF THE PROSTATE: AN ANALYSIS OF 190 CASES.

Hugh J. Jewett, Johns Hopkins Hospital, Baltimore, Md. J. Urol. 61: 277-80, February 1949.

From 1904 to May 1948, 222 cases of radical perineal prostatectomy were done at the Johns Hopkins Hospital for suspected cancer of the prostate. Thirty-two of these were rejected from the series because microscopic sections failed to disclose cancer in 24, and the pathologic report was missing in 8. The study, therefore, was based on 190 cases of microscopically proved cancer of the prostate.

Of these 190 cases, 132 were done prior to May 1, 1943. In 54 of these, rectal examination had disclosed evidence of extraprostatic extension. In 78, the tumor was believed to be completely confined to the prostate on rectal examination. In the first group of 54 cases, 7 (13%) lived six to nine years without recurrence, and received no hormonal therapy. In the second group of 78 cases, 40 (51.3%) lived five years or longer without recurrence and without castration or estrogen. In this second group of 78 cases in which the tumor was believed to be confined to the prostate on clinical examination, 43 were operated on prior to May 1, 1938. Of these, 12 patients lived or are living ten to twenty-seven years without demonstrable cancer, a ten year survival of 28%.

In the group of 78 cases in which the growth was believed to be confined to the prostate, there were 31 cases in which a circumscribed nodule of stony or almost stony consistency had been described, lying within one lateral lobe. In only 5 of these did the microscopic sections confirm the existence of strictly localized carcinoma. In the remaining 26, carcinoma had extended more or less widely throughout the gland, and in 11, cells were present in the perivesicular tissues. In the total group of 78 cases clinically confined to the prostate, 31 on section showed carcinoma cells in the perivesicular tissues. Twelve of these lived or are living five years or longer without recurrence, and 4 have survived nine to sixteen years without castration or estrogen. These observations indicate that the radical operation, to be curative, must at all times be as radical as possible; the bladder neck should be removed, and also the layer of fascia covering the seminal vesicles in front, and the layer covering them behind so that carcinoma cells lying between the two layers will not be left behind.

The operative mortality in 190 cases was 6.3%, but in the last 100 cases was only 3%, and in the last 50 cases was zero. Postoperative incontinence was less conspicuous with Vest's method of closure. One hundred cases with this method of closure were followed. In 75, the control was perfect; in 13, there was slight stress incontinence on coughing, sneezing and straining of insufficient degree to require a precautionary device; in 12, incontinence was marked and required a urinal or clamp.

The applicability of the radical operation has been extended during the last ten years. During this period 713 patients with carcinoma of the pros-

tate had been seen at the Brady Urological Institute, and the radical operation done in 127. Of these 127 cases, however, only 80 were believed to be clinically confined to the prostate on rectal examination, an applicability of 11.2%. It would seem that the radical operation could be made more widely applicable if physicians in general did not await the appearance of characteristic features of extraprostatic extension before entertaining the diagnosis of prostatic cancer.

Until it can be demonstrated that the conservative management of a comparable group of microscopically proved cases will yield as high a percentage of ten year survivals, radical perineal prostatectomy remains the procedure of choice for early cancer. 6 references. 1 table. *Author's abstract.*

CARCINOMA CELLS IN PROSTATIC SECRETIONS.

Donald D. Albers, Mayo Foundation, John R. McDonald and Gershom J. Thompson, Mayo Clinic, Rochester, Minn. J.A.M.A. 139:299-303. Jan. 29, 1949.

In view of the present inadequacies of the early diagnosis of cancer of the prostate and the recent enthusiasm for cytologic diagnosis of cancer, it was deemed advisable to study the diagnosis of prostatic carcinoma based on examination of the prostatic secretions.

After preliminary studies prostatic secretions were obtained in the usual method from a series of 100 patients with clinically benign lesions of the prostate, and a series of 41 patients with clinically malignant lesions of the prostate gland. The secretion from each patient was collected on about 4 slides, spread thin, and immediately fixed in a mixture of alcohol and ether (50% of each). After a minimum of thirty minutes in the fixative solution, the slides were stained with a modified hematoxylin-eosin technic. They were examined under the 100-power and 400-power objectives of the microscope on which the mechanical stage was used to insure complete coverage.

In 3 of the 100 cases in which a clinical diagnosis of benign hypertrophy was made preoperatively, carcinoma cells were seen in the secretion and a malignant lesion was found on pathologic examination of tissue removed at transurethral resection. All of these patients had transurethral resections. In 17 of the 41 cases in which clinically malignant lesions were present in the prostate gland, secretions could not be expressed. In the remainder there was good correlation between the cytologic and pathologic diagnosis. One carcinoma grade 1 (Broders' classification) was seen in each series in which the secretions were considered benign.

The following conclusions were derived from this study:

1. Carcinoma cells can be found in prostatic secretion, and finding them justifies the diagnosis of carcinoma of the prostate.

2. It appears that the most differentiated prostatic carcinomas, showing small glands that lack papillary infolding and consisting of cells which are difficult to distinguish from the normal (grade 1), will not be detected with this procedure. There appears to be good correlation between the results

of the study of secretions and the results of the study of tissue sections in the detection of the other grades of prostatic carcinoma which show less differentiation.

3. Carcinoma cells were detected in 3 of 100 cases of clinical benign hypertrophy; therefore, such cells can be detected when carcinoma is not suspected clinically.

4. The presence of carcinoma cells and, in the case of the more differentiated carcinomas, the presence of clusters of carcinoma cells are essential for the diagnosis of prostatic carcinoma on the basis of examination of the prostatic secretions.

5. Nuclei of squamous and transitional epithelial cells, clumps of benign prostatic epithelial cells and, especially, cell-like structures which appear in conjunction with spermatozoa may be confused with carcinoma cells until experience has been gained. 8 references. 5 figures.—*Author's abstract.*

21. The Musculoskeletal System

See Contents for Related Articles

22. The Respiratory System

See Contents for Related Articles

23. The Cardiovascular System

EXTREME HYPERTENSION IN A CHILD CURED BY NEPHRECTOMY. REPORT OF A CASE AND REVIEW OF THE LITERATURE.

Benjamin M. Gasul, Julius M. Glasser and Aaron Grossman, Mt. Sinai Hospital, Chicago, Ill. J.A.M.A. 139:305-307, Jan. 29, 1949.

A girl aged 9 was first seen on November 10, 1946, with a history of having awakened early in the morning complaining of generalized abdominal pain, followed by repeated attacks of vomiting.

Examination was negative except for a blood pressure varying from 175-160 systolic and 140-130 diastolic. Ophthalmoscopic examination revealed numerous hemorrhages on the disk and scattered throughout both fundi. Urine examination was negative. Blood chemistry was within normal limits.

On the next day, a generalized convulsion developed and a spinal puncture revealed uniformly bloody nontraumatic fluid. An intravenous pyelogram indicated practically no dye in the right kidney, and an enlarged apparently normal-functioning left kidney.

A diagnosis was then made of a possible "Goldblatt" kidney and a nephrectomy was performed. Pathologic study revealed pyelonephritic atrophy of the right kidney.

The patient was discharged from the hospital on the eleventh postoperative day, with a blood pressure of 134 systolic and 90 diastolic, and normal urine and chemical content of the blood.

Two years after the nephrectomy the blood pressure was normal, the urine and blood chemistry were normal, and the hemorrhages noted before the operation were no longer present. 5 references. 3 figures.—*Author's abstract.*

24. The Hemic and Lymphatic Systems

PHOSPHATASES IN BLOOD OF MAN. VALUES IN WHOLE BLOOD, PLASMA, CYTOLYSATES AND ERYTHROCYTIC SUSPENSIONS.

H. Behrendt, New York Post-Graduate Medical School and Hospital, New York, N. Y. Am. J. Clin. Path. 19:167-76, February 1949.

Studies of the phosphatase activity of whole blood, blood plasma, blood cytolysates, and suspensions of erythrocytes in saline solution were made, most measurements being at the established optimum pH of the acid and alkaline enzymes. An isotonic setup of cell suspensions, buffer and substrate, was used in an endeavor to make in vitro studies of the factors governing substrate-enzyme accessibility in vivo. Results indicated that phenylphosphate at pH 4.9 must pass through the erythrocyte membrane if it is to be acted upon by the enzyme, phosphatase. This would be similar to penetration of such permeants as phenylacetate but, probably because of its ionization, phenylphosphate has no hemolytic effect like that of phenylacetate. The potential significance of quantitative enzyme studies on suspended red corpuscles has been confirmed by measurement of anhydrase activity in living, suspended red blood cells. The isotonic arrangement also enables the kinetics of phosphatase reactions, catalyzed by intact living erythrocytes and by red cell cytolysates, to be compared, but the discrepancy between fermentation by yeast cells and yeast extracts throws doubt upon the result.

These studies showed that acid phosphatase activity of red cells is reduced in the presence of plasma, this inhibition being equally strong with suspensions or cytolysates. Action of plasma upon the enzyme does not seem to be mediated by osmotic factors bound to the presence of intact cells. Final conclusions concerning the cytolysate activity in these studies should, however, await results of other experiments in which leukocyte and platelet activity has been properly considered. 21 references. 5 tables. 2 figures.

25. The Digestive System

POLYPS OF THE SIGMOID OCCURRING THIRTY YEARS AFTER BILATERAL URETEROSIGMOIDOSTOMY FOR EXSTROPHY OF THE BLADDER. REPORT OF A CASE.

Claude F. Dixon, Mayo Clinic and Rodger E. Weissmann, Mayo Foundation, Rochester, Minn. Surgery, 24:1026-34, December 1948.

Transplantation of the ureters into the rectosigmoid or sigmoid flexure of the colon has been increasingly used in the last twenty years in the treatment of certain malignant and serious benign lesions of the urinary tract. It has been found that the distal part of the colon and the rectum have been able to readjust well to physical and chemical alterations of their contents caused by the influx of urine.

In the case reported, bilateral transplantation of the ureters into the rectosigmoid had been done when the patient was three years of age, because of exstrophy of the bladder. Excision of the mucous membrane and muscularis of the exstrophied bladder and a portion of the abdominal wall had also been done. The patient made a good recovery, developed normally and was working actively as a research engineer after taking his engineering degree. Thirty years after his operation for exstrophy of the bladder, he was readmitted to the Clinic with a history of attacks of pain in both costovertebral angles and flanks, with chills, fever and headache. These attacks had become progressively more frequent and more severe in the last five years. Proctoscopic examination showed a polyp on the right anterior wall of the rectosigmoid. As an excretory urogram showed the left kidney to be nonfunctioning and the right kidney normal except for a slight horseshoe deformity, the left kidney was removed; pathologic examination showed hydro-ureter, hydronephrosis and chronic pyelonephritis. Subsequent x-ray examination of the colon showed multiple polypoid lesions at or near the ureteral orifices; the one at the opening of the left ureter was the larger and, on pathological examination, showed areas of grade 1 adenocarcinoma. It had also caused localized recurring intussusception involving the area of transplantation of the left ureter. Transcolonic excision of both colonic lesions was done and the patient made a good recovery. Nine months later, he reported that he was well and carrying on his usual activities.

No case similar to the case reported was found in a review of the literature. A search of the records of the Mayo Clinic showed no instance of loss of function in a kidney which was normal following ureteral transplantation into the sigmoid colon. Apparently the intussuscepting polypoid lesion near the colonic orifice of the transplanted left ureter had caused repeated episodes of ureteral obstruction and pyelonephritis for five years, with ultimate loss of function of the left kidney. In spite of considerable anatomic involvement of the orifice of the right ureter by the other (distal) colonic polyp, there was no evidence of obstruction of this ureter. This case suggests that if signs of obstruction of the upper urinary tract occur many years after a successful transplantation of the ureters into the sigmoid, a thorough proc-

toscopic and roentgenographic study of the distal part of the colon should be made. If any obstructing colonic lesions are found, their removal and treatment of urinary tract infection may prevent serious damage to the kidney. 17 references. 3 figures.

26. The Endocrine System

DIAGNOSTIC SIGNIFICANCE OF URINARY HORMONAL ASSAYS. REPORT OF EXPERIENCE WITH MEASUREMENTS OF 17-KETOSTEROIDS AND FOLLICLE STIMULATING HORMONE IN THE URINE.

Roberto F. Escamilla, University of California Medical School, San Francisco, Calif. Ann. Int. Med. 30:249-90, February 1949.

The availability of a chemical test for measuring 17-ketosteroids in the urine has stimulated more general interest and research in this field of urinary hormonal assays. A review of tests now being used reveals that most are biological assays requiring the use of animals. Outlines of the methods used in most of the tests are given.

Tests more generally available at this time are: those for detecting pregnancy and those for measurement of 17-ketosteroids, follicle-stimulating pituitary gonadotropin, and pregnandiol. Tests for measuring estrogens and the glycogenic adrenal corticoids give promise of more widespread clinical acceptance.

Experience with 488 tests for 17-ketosteroids and 233 tests for FSH at the University of California Hospital has been reviewed. Normal ranges from our experience were compared with those of other authors.

Low values for 17-ketosteroids were found in the following conditions: hypophyseal infantilism, Simmonds' disease, anorexia nervosa, Addison's disease, myxedema and severe asthma. The average for Simmonds' disease was lower than that for anorexia nervosa, but there was overlapping in the ranges of the two.

High levels of 17-ketosteroid excretion were found in adrenal cortical carcinoma and hyperplasia. When further separation into alpha and beta fractions of the 17-ketosteroids was done, the beta fraction was particularly elevated in the patients with carcinoma. However, one patient with adrenal cortical carcinoma showed normal values.

Slightly high levels of 17-ketosteroids were found in patients with simple hirsutism, Cushing's syndrome, acromegaly, pregnancy and hyperthecosis. Slightly low levels of 17-ketosteroids were noted in eunuchoidism, male and female castrates, diabetes mellitus, occasionally in the male or female climacteric, and in chronic debilitating diseases. There was a tendency toward lower levels in old age.

The slightly high and slightly low levels are of limited clinical value because of the considerable daily variation in 17-ketosteroid output in the

same individual, which may cause the level to vary in and out of the normal range.

A long list of conditions showed normal 17-ketosteroid excretion. These included hypogonadism, ovarian aplasia, gynecomastia, simple amenorrhea, oligospermia, obesity, alopecia and various psychiatric disorders.

FSH excretion was measured by bio-assay and a definite end-point was more difficult to find. Occasionally it was necessary to test several specimens at various levels.

The excretion level of FSH was always high in ovarian aplasia when the patient was not receiving estrogenic therapy. This is one of the cardinal points in the clinical diagnosis of the condition. It was occasionally high in the male and female climacteric, seeming more consistent in the latter, in eunuchoidism, and in hyperthecosis. A high value was found in one female castrate.

A low level of FSH excretion was noted in patients with hypophyseal infantilism, Simmonds' disease and anorexia nervosa. The latter condition also shows normal levels, but unfortunately again, there was overlapping in the ranges with Simmonds' disease. Some eunuchoids also showed a low level of FSH excretion, and may represent a separate group from those with high values.

Normal values for FSH excretion were encountered in acromegaly, anorexia nervosa, hyperthyroidism, hypothyroidism, Cushing's syndrome, adrenal cortical hyperplasia, simple hirsutism, Addison's disease, gynecomastia, the climacteric, hyperthecosis, oligospermia, and alopecia.

The greatest clinical value of the test for 17-ketosteroids at present is in the high levels found in adrenal cortical hyperplasia and carcinoma, and the low levels of hypophyseal infantilism and Simmonds' disease.

The test for FSH is particularly valuable in its high levels in diagnosing ovarian aplasia and the climacteric. The low levels are of value in pituitary infantilism and Simmonds' disease.

The tests have resulted in a better understanding of some of the clinical syndromes and it is possible that further fractionation of the 17-ketosteroids may considerably increase their diagnostic importance. 94 references. 3 tables.—*Author's abstract.*

ANDROGEN: KETOSTEROID RATIOS OF RABBIT URINE.

C. T. Davis, C. R. Slater and B. Krichesky, University of California, Los Angeles, Calif. Endocrinology, 44:83-87, January 1949.

Low levels of androgenic compounds have been found in rabbit urine extracts. The amounts of biologically active androgens were determined by the chick comb method while total 17-ketosteroids of the same extracts were determined by the Zimmerman colorimetric method. Thus it was found that the proportion of biologically active material in the "neutral ketonic fraction" of rabbit urine amounted to only a fraction of that in human urine extracts, prepared by the very same methods. Coupled with the initially low concentration of androgenic substances presumed present

in the untreated rabbits' urine was the fact that the extraction procedures caused considerable inactivation of the androgens, as indicated by low recoveries by bio-assay of added androsterone. Total ketosteroid recoveries based on colorimetric values were less affected by the extraction. Using androsterone as a standard, only about 2% of the "neutral ketonic fraction" of male rabbit urine and about 1% of that of female rabbit urine was biologically active. Both alcoholic and non-alcoholic ketosteroids were found, but beta-hydroxy ketosteroids were not detected. 14 references. 4 tables. 1 figure. —*Author's abstract.*

27. The Nervous System

A REPORT ON SEXUAL FUNCTION IN PARAPLEGICS.

Herbert S. Talbot, McGuire Veterans Administration Hospital, Richmond, Va. J. Urol. 61:265-70, February 1949.

In an analysis of 200 male paraplegics, it was found that 36.5% were unable to have erections; 42.5% have reflex erections evoked by local stimulation; 21% have erections resulting from psychic stimulation. Of the 200, 46 have had intercourse with intromission; 20 of these had ejaculations and 12 more reported gratification with no ejaculation. These patients are not essentially permanently impotent since two thirds of them have at least a reflex erectile response. 7 references. 3 tables.

28. Cancer Research

FURTHER STUDIES ON THE PATHOGENESIS OF OVARIAN TUMORS IN MICE.

Min Hsin Li, Ph.D. and W. U. Gardner, Ph.D., Yale University School of Medicine, New Haven, Conn. Cancer Research, 9:35-41, January 1949.

The possible role of gonadal and gonadotrophic hormones in the genesis of intrasplenic ovarian grafts was studied in castrated male and female mice. Oily solutions of the steroid hormones were given subcutaneously and aqueous solutions of the gonadotrophic hormones were injected daily. The injections were all started in mice having grafts 92 to 138 days old. Granulosa-cell tumors, luteomas, and a mixture of these developed in the grafts, indicating that there was no strain limitation in formation of these tumors in mice. No ovarian tumors developed, however, in these grafts in unilaterally gonadectomized mice; in gonadectomized mice given estradiol benzoate or testosterone propionate; or in gonadectomized mice having vascular adhesions permitting ovarian hormones to avoid the hepatic portal circulation.

These experiments confirmed previous findings that pituitary gonadotrophic hormones are involved in ovarian tumorigenesis in at least these

experimental animals. Failure of ovarian tumors to appear in these experimental grafts indicates that tumor formation in these transplants was inhibited by the intact gonads. The tumor incidence was not changed by progesterone in the amounts and with the weekly schedule used. A lutenizing action was exerted on the ovarian tumors by daily injections of gonadotrophin from pregnant mares' serum. The malignancy of these induced tumors is illustrated by their ability to metastasize and their transplantability into new hosts. The fact that the uteri of tumor bearing hosts were larger than those of castrated animals indicates that the tumors produce sufficient estrogen to permit some of it to pass through the liver or to be a type not inactivated by the liver. 16 references. 1 table. 9 figures.

29. Urologic Armamentarium

A NEW CYSTOSCOPE AND ITS CLINICAL USES.

Thomas J. Kirwin, New York Hospital, New York, N. Y. J. Urol. 60:537-41, September 1948.

In the new cystoscope described, there have been introduced several principles of construction never before employed in such an instrument. An original lens design affords a large right-angle field of vision, carefully corrected for chromatic and spherical aberration. The lens system itself has been coated to reduce loss of light by reflection as well as to eliminate shadows, flare and "ghost images". The reduction of the amount of light *lost* increases the amount of light *transmitted* two and a half times that provided in the older type cystoscopes.

A flexible beak facilitates introduction of the cystoscope into the urethra. This is particularly useful when an enlarged median lobe is to be encountered. Because the fenestra is double, the examiner can view both sides of the bladder without changing the position of the sheath. Other notable new features are the extra large inlets and outlets for water, with modified stop-cock for its control: an improved bayonet-type lock, and a stationary light inlet.

Heretofore it has been impossible to sterilize by boiling any optical instrument because of their non-heat-resistant construction. The achromatic elements of the optical system of the Kirwin instrument are cemented with a monomeric organic cement polymerized to a thermo-rigid state by heat. The objective and ocular settings have been made with heat-resisting cements. This construction permits sterilization by either autoclaving or boiling—a most important advantage.

There are five excellent illustrations by William P. Didusch, which, as the author remarks, show better than any written description the convenience and ease of manipulation, the wider range of usefulness and the mechanical exactness which place this new instrument in a class by itself. 5 figures.—*Author's abstract.*

NEW MODALITIES IN UROLOGY.

Joseph Francis McCarthy, New York Polyclinic Medical School and Hospital, New York, N. Y. J. Urol. 61:104-107, January 1949.

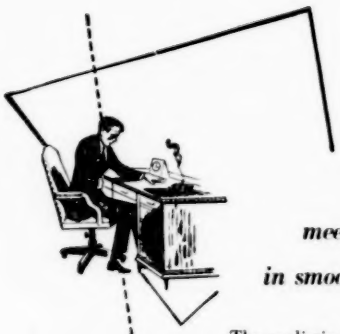
There was presented as the first modality a method of remote control of cutting and coagulating currents (electronics) in the operation of prostatic resection. The cutting is regulated by finger pressure on a small red button. A white button, both built into the electrotome, regulates coagulation. Thus is eliminated the need of the awkward foot-switch. This permits a saving of operating time, with a reduction in blood loss. Instantaneous finger-tip control of bleeding obviates, in large measure, the lens clouding in a bloody field, occasionally observed during clumsy foot-switch manipulation.

The second presentation was a diagnostic and operating retrograde telescope for the better visualization of the end results of resection by retrospective vision, and increased facility in the arrestation of arteriolar bleeders at this point. By means of this system of lenses one sees the floor of the internal sphincter as well as the deep urethra, without necessity of re-orientation. In this system right side is right side; left side is left side; moreover, the picture is upright.

The third presentation is the application of a new electronic switch attachment to the already existing hard rubber cutting and coagulating electrode, for tumors through the open bladder. It is applicable to more effective management of borderline cases of benign or malignant neoplasms, the latter of the papillary type. These are better treated by this method than endoscopically and because the bladder is completely mobilized, widely opened, and protected by gauze packing between this organ and the subjacent intestinal structures; thus the operator can be as radical as the occasion indicates without the possibility of damage to the structures, or pericystitis.

There were also presented for consideration the educational possibilities of a wire recording apparatus, as well as the first attempts at reproduction and magnification of heart sounds for class teaching.

Finally, the thought was advanced to apply the principle of electron optics. Here, the electro-magnetic lens may ultimately replace the ordinary lens system of today, and the electron beam may equally well replace the light ray. Further, the electron picture thus produced is projected on a sensitized screen. Bystanders may thus observe, as does the operator, a form of television as it were, of growths in the bladder. 3 figures.—*Author's abstract.*



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